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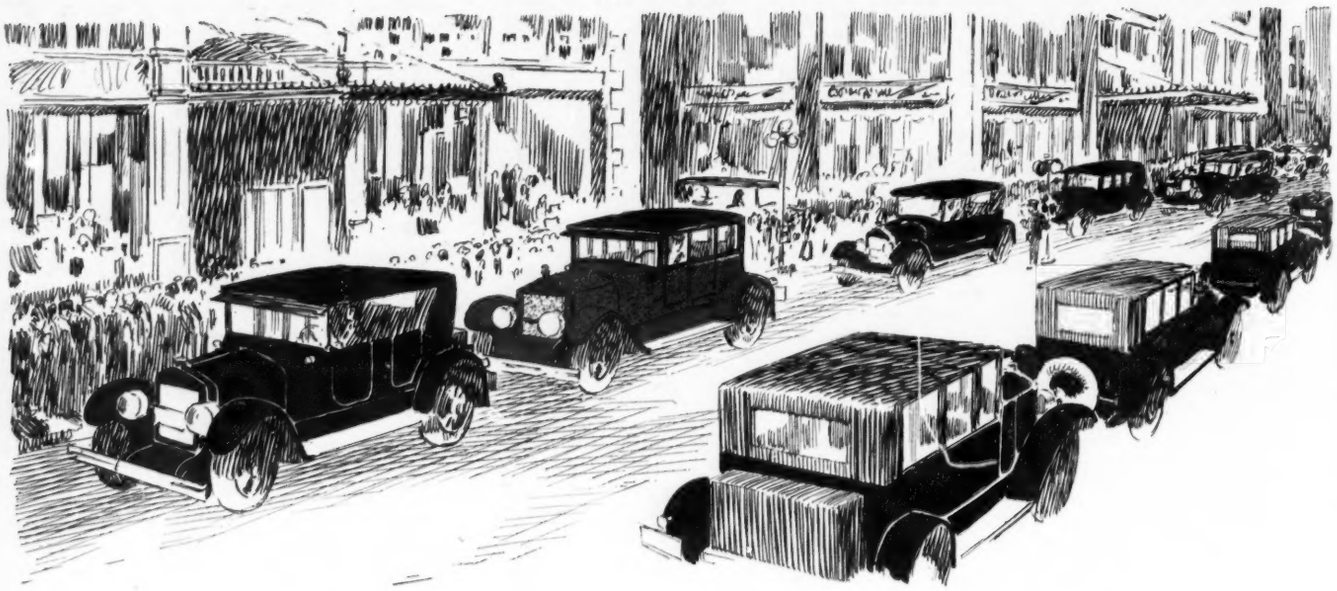

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AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

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Style—an Eternal Force in Car Merchandising

Sales value of automobile bodies recognized more fully than ever before. Quality of upholstery and fittings is important in determining resale values.

THE merchandising value of the body has not been fully recognized in marketing either new or used cars, according to some leaders of the body building industry. Style is a strong factor in influencing car sales. Its relative importance has not been sufficiently utilized in the past.

A cursory analysis of the motor car advertisements in national magazines will offer evidence of the fact that 90 per cent of the car manufacturers are selling chassis specifications and chassis performance with relatively little reference to the style or comfort incorporated in the body.

Last week at the convention of the Automobile Body Builders' Association, H. H. Rice, president of the Cadillac Motor Car Co., said that the public had generally accepted the fact that nearly all chassis were good, but varying in the degree; but that little attention had been given to body merchandising and that the selling organizations have not recognized what a potent factor the body can be made in the original sale as well as in the resale of the car.

BODY manufacturers share this opinion, not only those manufacturing the body shell but those manufacturing the trimmings, upholstery, hardware, fittings and the like. Wholesale and retail selling organizations are not posted on body selling; are not educated on what is right, and what is wrong in body trimmings and fitting and are not prepared to talk as intelligently on upholstery materials as they do on details of chassis design.

An outside point of view on this comes from the various manufacturers of upholstery materials and other body requisites; they are unanimous in the verdict that the value of the body as a sales asset is rarely realized by the car maker and that more attention must be given to the body, its materials and trimmings. At present when closed types constitute so large a percentage of sales with many car companies, details, fittings and furnishings call for special emphasis.

THE importance of this becomes apparent when it is learned that few automobile concerns have a fabric expert in their organization. When a fabric maker tries to sell upholstery material for a sedan or coupe, he has to run the gamut of trying to sell the body engineer, the purchasing agent, the sales manager, and very frequently some representative of the dealer. Not one of them has more than a cursory knowledge of the fabric business.

This charge against the industry is a serious one when viewed solely in the light of a business transaction, and the importance of the charge increases if we accept the fact that the interior decoration of a sedan or coupe is one of the most potent factors in the sale of a car, which is increasing day by day.

In the furniture industry the situation is cared for by the employment of fabric experts for the selection and purchase of upholstery and other materials. The charge has been made by some large fabric manufacturers that the automotive industry is one of the most unsatisfactory they do business with due to this lack of knowledge of fabrics.

One authority in the fabric business put the solution this way:

"The cloth that we furnish for a car is one of the most important things in the sale of that car, but we find the engineer who knows a lot about steel, wood, or aluminum knows nothing about fabrics, and yet he is often called into the consultation in deciding on interior finish of a closed car.

"In selling fabric to some companies you must sell the body engineer, the purchasing agent, the sales manager, very often the general manager, and not infrequently a few influential distributors, not one of whom is competent to pass on the product.

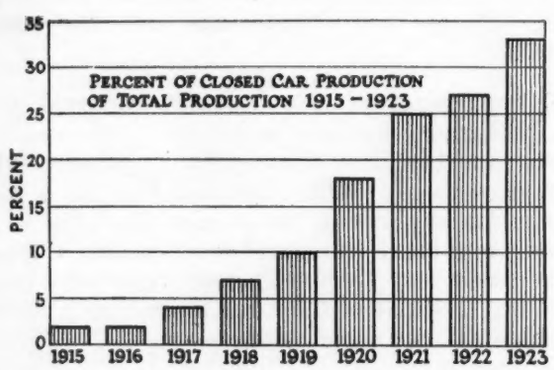
"The resale price of a closed car, a sedan, or coupe is very largely determined by the appearance of the finish of the car at the end of one, two or three years. If the interior looks well, if the upholstery material has worn well and has not faded, the car has a good resale value; but if, on the other hand, as too often occurs, the material has faded, or shows signs of wear the resale value of the car is proportionately reduced."

Car manufacturers today realize that the resale value of a closed job, particularly a sedan or coupe, depends on the condition of the interior finish. A closed car represents an investment of from $500 to $1,000 more than an open car and the owner recognizes the fact that his resale equity on this added investment is dependent almost entirely on the materials used in upholstery and interior finish. The period of use before the resale of a sedan or coupe will be longer than on an open car due to the increased investment, which makes the question of better materials for closed types almost mandatory.

Requisites of Body Upholstery

The requisites of a good upholstery material for closed cars are that in addition to fine quality the effect should be that of coolness in the summer and warmth in winter. The interior finish of a sedan or coupe is different from that of a chauffeur-driven vehicle, and the two classes should be considered separately.

The chauffeur-driven job calls for a lustrous material, whereas with sedan or coupe more sober effects are desirable. Some fabric authorities favor worsted as the most suitable fabric for sedan and coupe body types, due to the quality of the weave and its ability to look well after being used for two or three years. A worsted is made from long strand wool, which is twisted in such a way as to add strength and insure wear.



Closed car production has increased rapidly since 1915 and styles in design have changed materially

Instead of reducing the quality of the interior materials in closed types the makers should be improving it, and so insuring the resale value of the vehicle. The value of the body as a selling asset is on the rise, and designers are recognizing that unthought of potentialities of merchandising lie in this field.

We have passed through what might be described as a cycle of severity in interior finish in closed cars, and the pendulum is swinging toward a cycle of art in interior finish which will gain in favor because of the added original and resale value. An essential of art is simplicity, coupled with a definite motive.

Today only 2 per cent of the money expended in materials for the car goes into cloth, carpet, and silk for the interior finish of the job. This is not sufficient. There are a few examples in small production cars which show how money can be invested to advantage in better interior finish.

With the body gradually assuming the position it should in relation to the chassis, the question of body trends in design takes on added importance. Body styles are certain to keep changing from year to year—not radical changes, but none the less changes that will have a very definite and stimulating effect on sales.

Die Cost Retards Body Changes

With a large production car changes in bodies dictated by style are determined largely by investment in tools and dies. The tool and die cost approximates $5 per car for the life of the design. The initial equipment in dies alone would approximate $225,000, for one line of production bodies and so such models must be continued for two years and perhaps longer before a change is warranted. The length of life of any body design will be determined by its sales appeal. The last two years have given many striking examples of the amazing sales stimulation which may result from a good body design.

Changes in designs will not always include fundamentals of body lines, since quite different effects can be obtained by new radiator shapes and other refinements which can be classed as minor changes.

No effort is made here to predict the course of body trends, but it can be said that the round corner effect of the rear in closed jobs is gaining. The use of fabric as a body material is stimulating this movement, which apparently is an effort to imitate the leather covered cabriolet type.

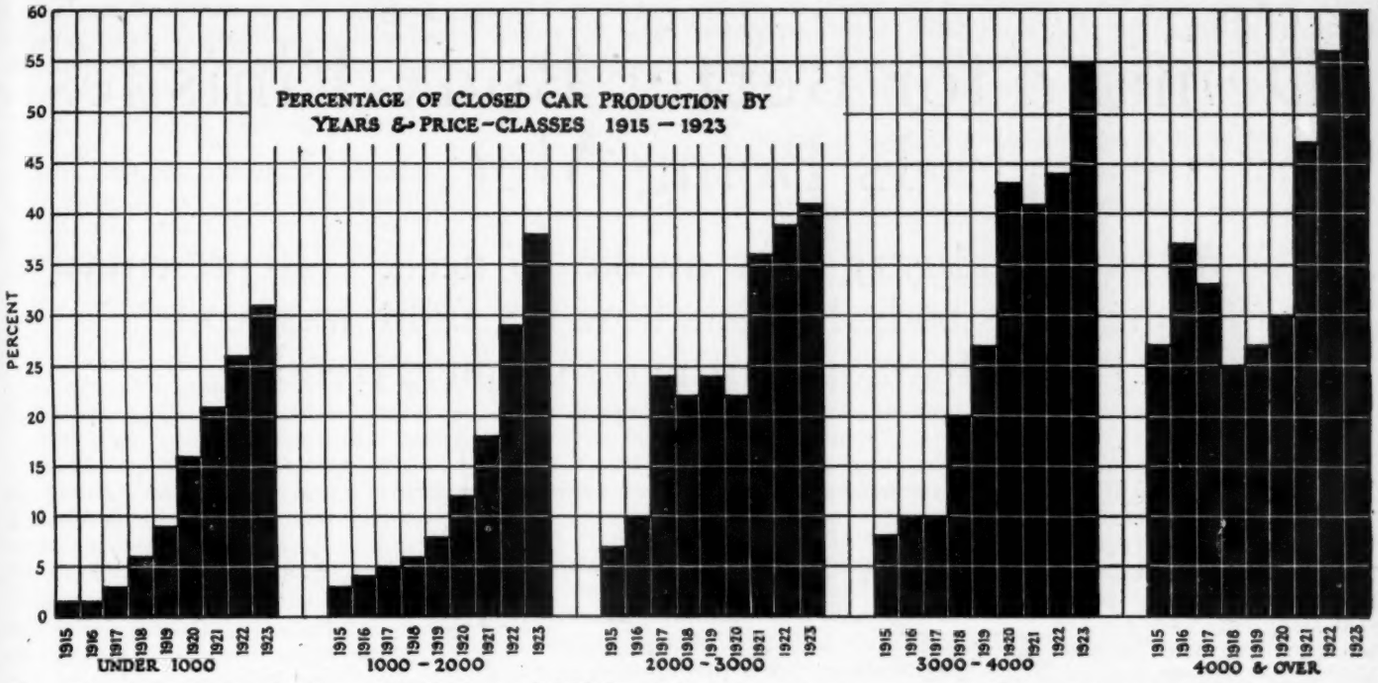
The movement toward smaller cars with wheelbases of 108 to 116 inches is exerting a definite influence on body design. The five-passenger vehicle is the undisputed leader and the necessity of having a seven-passenger car so as to take the neighbors for a ride has passed. Traffic conditions have exerted an influence and no longer is the merit of the car a factor of its wheelbase or piston displacement.

Quality Fittings Urged

The shorter wheelbase means reduced body size and generally reduced body cost, both factors in making for economy. Price influences the selection of body fittings, but the car manufacturer must take care that reduced cost, obtained by the use of cheaper materials does not prove costly in the long run by lowering the resale value of the vehicle. Quality will show up clearly in fittings and upholstery after the car has been in use two or three years, which is a critical time in the making of a car's reputation.

Steel seems likely to maintain its position as the chief body material in large production lines. For high-priced limited production aluminum probably will hold its position, since use of aluminum does not necessitate as large die costs as does use of steel for large production. Aluminum has a very definite advantage because of its light weight, the saving on a large sized sedan being 75 to 100 pounds as compared with steel. Aluminum will not rust and is easier shaped, but it has not the strength of steel and is more easily injured by careless workmanship in production.

The fabric or leather cloth body has proved in use practically all that was claimed for it when placed on the market over a year ago. The original bodies made of this material have had service of 40,000 miles road use and apparently are in as good condition, without



Closed cars have offered a particularly good field for style changes in the past. Development in this field has been rapid in recent years

having been refinished, as when put out. This type of body is still new and its general acceptance by the trade is still a question. The price of such jobs in quantity production probably will be slightly less than that of bodies of similar quality with metal panels. Their durability is equal to that of high-baked enamel finishes provided good material is used. The fabric body has the great advantage of silence, is lighter than any other body of smaller size, and is claimed to be easier to keep clean. Those using this type are reported to be satisfied.

Custom body builders see in the constant improvement of the production body by big manufacturers, an indication that there is not any immediate prospect for great improvement in the custom-made trade even in our large cities where exclusiveness is a quality desired by many buyers. The custom-made body trade has been at a low ebb for some time, as no two producers are quite agreed on when material improvement will take place.

A special custom-made body may cost four or five times that of a production body and no guarantee goes with the special job. Style is being incorporated in the production body today as never before, and in spite of the heavy investment in tools and dies for production jobs, style is not going to be lost sight of, because of its great sales appeal. If designers of production jobs can keep sufficiently ahead in matters of design, then it will be possible to develop production jobs which will carry on for at least two seasons and perhaps longer. Small changes each year can be made without disturbing the general lines which cannot be altered because of tool investment.

Style Moves in Cycles

Style in motor car bodies, as in all other lines, moves in cycles. Style is a matter of periods and in the motor car industry these periods of design will succeed each other as surely as style changes in articles of clothing succeed each other with inevitable regularity. In the motor car bodies styles are controlled largely by methods of manufacturing and cost, but beyond the limits set by these two yardsticks there is no question but that varieties of design and cycles of fashion will follow each other for years to come.

The body building industry today is in the hands of large manufacturers who must and will continue to build at a given price, but these producers are studying the artistic in body work and there is not a question but that we will witness improvements in body style which will be just as amazing as the constant procession of improvements in chassis development in the last four or five years.

Sales Appeal Strong

Here, however, is a field where there is a stronger appeal to the optical sense than in chassis parts which have been used as merchandising arguments to close a sale. The body, which might be designated as the garment which clothes the naked chassis, has many appeals, not the least of which is that of interior quality. Quality and style go hand in hand. Styles originate with quality goods. Today the question of style, not only in body lines, but also interior finish, is not sufficiently understood to serve as the great selling force it might be. The work of education in body style and quality, coupled with all factors of public appeal, must start from the factories and reach to the furthest end of the selling organizations.

All educational work is slow. It cannot be accomplished in a week or a month, but the time is at hand when the total selling value of the body must be understood and translated into intelligent sales language as never before.

The advertisements of the manufacturer much not neglect body style and quality as they have up to the present. Advertisements have analyzed the chassis components and cited the merits of each, but the separate classes into which body arguments can be divided have not received attention.

When the sales appeal of these motor advertisements in a woman's publication are compared with advertisements of products from other industries in the same magazines, a great lack of woman's appeal is apparent. Style keeps some industries at their present status. Style is one of the strongest sales arguments. Style is one argument which appeals to all peoples, to all races, to all ages. Its magnetism never ceases. It is an eternal force in all forms of merchandising.

Demand for Better Body Finishes Is Being Met

All branches of industry now awake to need. Representative Clancy tells body builders how tax fight was won. H. H. Rice optimistic on business trend.

AN automobile too often is a five-year mechanism with a six-month finish. Better body finishes are being developed to eliminate this anomaly. Distinct progress has been made in recent months. Need for further development along this direction was one of the chief points brought out at the Automobile Body Builders Association meeting which is described in this article.

DEVELOPMENT of body finishes has lagged behind progress in chassis and power plant design with the result that many cars have gone to the customer with a five-year mechanism and a six-month finish. The automobile manufacturers, body builders and finish producers now are fully awakened to this condition and are bending every effort in the direction of producing finishes which are as durable as the mechanical parts of the car. In a general way this finish must be bright, lustrous and durable as experience has demonstrated that the average buyer insists upon a shiny new car in spite of the fact that some of the egg shell or oil finishes have had a better reputation for permanency. These conclusions, along with the optimistic predictions of H. H. Rice, president of the Cadillac Motor Car Co., and the recommendation of the Hon. Robt. H. Clancy that the automotive industry capitalize the political standing which has been forced upon it, were the high spots of the annual convention of the Automobile Body Builders' Association which was held in Detroit during June 2 and 3.

An exhibit of body materials was an added feature of this convention. About 35 manufacturers of trimming and finishing materials and body hardware showed their products in the same room in which the larger meetings were held. Included among the exhibits were also representatives of the suppliers of equipment for treating and drying body finishes. While no complete bodies were exhibited, great interest was shown in the displays of the component parts.

In discussing "Our Industry," H. H. Rice, president of the Cadillac Motor Car Co., reviewed the progress and general requirements of automobile finishes. He said that horse-drawn standards of finishing quality must be discarded permanently since automotive service is at least ten times more severe. Most of the existing finishes constitute the greatest weakness of the manufacturing and service program. On an average, service complaints on the finish are five times greater in number than all of the complaints regarding the chassis and powerplant. Most of the present finishes, when the necessity for high luster and colors are remembered, require too much of the manufacturers capital and effort for the production of anything like a satisfactory job.

Even at their best, the older types of finish are not durable and the problem must be attacked at the very bottom. It is probable and desirable that many of the old line paint and varnish manufacturers will succeed in developing more satisfactory finishes. Whatever may be the chemistry or method of application, the inherent desire for shiny beads and bright colors which is a relic of the earlier existence of human kind must be remembered. Car buyers are attracted by a high luster, therefore this quality must be retained and means found for increasing its permanency. Regarding body types, Mr. Rice stated that the convenience of the riders is the absolute criterion and that the type or size of the powerplant or chassis details will be completely overshadowed by the body in sales influence.

Regarding the business outlook which is the immediate question in all gatherings at the present time, Mr. Rice stated that in his sincere opinion, no one ever made money by attempting to sell the United States short and that this statement applies equally well to the automotive industry. Many manufacturers and dealers have been misled into a false position by confusing inquiries with actual sales prospects. Just because the average customer looks at four or five lines before finally choosing a car is no reason for each of the former manufacturers feeling that he has lost an actual sale because he had no cars on the floor. Sales are not good but they are not bad, he stated, his company having sold more cars in the past two weeks than in the same period of last year.

No slump like that of 1921 is to be expected but, on the other hand, temporary fluctuations or recessions must be expected. The recession at the present time is moderate and with the tax bill out of the way the worst is over although the recent passage of the bonus bill will have a little unsettling effect. Banking interests state that there is nothing to indicate any protracted period of bad business and that the country as a whole is on a sound basis. It is Mr. Rice's opinion that busines will get under way again during the summer and continue good through the fall.

In dealing with the subject of "The Sales Value of Style," David Beecroft of the Class Journal Co. stated that the custom body builders have been as a class a tremendous factor in the establishment of new body styles and that in practically every case, style is synonymous with quality. Style is fundamental in any article of merchandise. It is the quality that keeps men from wearing last year's straw hats and changes the dining room table from round to square or rectangular at periodic intervals. As related to

the automotive industry or the body building business, style consists of creating an atmosphere around a steel skeleton. In order to awaken an appreciation of style as a sales asset, Mr. Beecroft advanced the following questions:

1. Is the selling force of style made use of in selling cars?
2. Is the factor of style understood?
3. Have the factors of style been analyzed?
4. Cannot body styles be analyzed to stimulate sales?
5. Cannot manufacturers utilize these features to better advantage?

His own experiences in making a first hand investigation of the value of style among New York car dealers demonstrated that car salesmen and dealer executives have little or no knowledge or appreciation of the way in which style factors could be used to advantage. An analysis of national advertising shows that practically every other commodity in the purchase of which women have a determining voice is sold on the basis of the style appeal while automobile manufacturers in general neglect this portion of the advertising message.

The Trend in Body Engineering

Body engineering trends were discussed by Mr. Kingston Forbes, body engineer of the Buick Motor Car Co. He said that the closed body is the predominant factor today and that the roadster again is becoming prominent due to the fact that cars are in general use. Where a car owner formerly felt obligated to buy a car which was big enough to give some of his neighbors a ride occasionally, cars are now being purchased on the basis of individual requirements. Mr. Forbes also reviewed briefly four general types of closed body construction which are as follows:

All-steel bodies.	Fabric bodies.
Steel panels over wood frames.	Weymann bodies.

These, with the addition of the Widman type of assembled construction, constitute the types available at the present time. In dealing with the subject of leather fabrics Mr. Forbes said that many engineers continue to specify the nap-back type, although this is the more expensive and has not the strength of the plain fabric-back material. Mr. Forbes also advocated the adoption of an increasing range of standards of many of the details of body hardware. The development of this principle as applied to window lifters in particular was discussed by Stanley W. Nicholson, chief engineer of the Dura Co. He advocated the adoption of standard window glass sizes and standard window channel sections in a moderate number. In addition to these, Mr. Nicholson discussed the advancement in window lifter design.

Auto "Bob" Clancy's Speech

In the absence of Hon. Robt. H. Clancy, representative in the House of Representatives from the Detroit district, his address, which was to have opened the series of meetings, was read by F. D. Mitchell, secretary of the body builders' association.

This address reviewed many of the details of the recent battle for automobile tax reduction and paid a high tribute to the cooperation rendered by the nine leading automotive associations. These associations rendered yeoman service in the recent fight and demonstrated that they are capable of coordinated action. Inasmuch as the industry was forced into the political field, Mr. Clancy asserted, this position should be consolidated and utilized for advocating all legitimate measures affecting automotive interests.

In this respect, he stated, the tariff question is one which deserves the attention of the whole industry, as manufacturers are compelled by the present rates to pay excessive prices for aluminum, plate glass, oil and many other requisites. The recent activity had the effect of removing the motor car from the luxury class and demonstrated the political strength of 15,000,000 motorists, and every additional means for protecting this great group should be followed up by the machinery which has already been partially organized.

Gives Credit to Automobile Associations

In giving his vivid picture of the fight which resulted in the reduction of taxes on automotive products, Mr. Clancy credited the victory in Congress to the powerful support, cooperation and assistance given by the nine automotive organizations. He said that while the estimates of the reduction were fixed at $25,000,000, he personally believed that it would be nearer $35,000,000 of this year's taxes.

He went on to state that the automotive industry had become the giant which had developed beyond agriculture, iron and steel, railroads, telegraph and telephone. He told many of the details of the fight which led to victory, from the near fist-fight on the floor of the House to the publicity and various other means used to incite interest and keep it excited.

He told a story of a fight between a shark and a swordfish, and a whale which illustrated the way in which the tax battle was fought.

"It was a titanic struggle," he said, "between a huge whale on the one side with a shark and a swordfish on the other. The shark would shoot half its length out of water and fall with a crash on the whale's back and sides, tearing out with its razor-like teeth great chunks of flesh. With lightning-like speed and terrific power the gigantic swordfish would sink its spear into the vitals of the whale.

"Soon the battle was over. The huge body of the whale quivered convulsively; the vibrant tail ceased its thrashing. Tens of thousands of predacious, voracious finny assassins and cannibals of lesser power than the shark and swordfish swam madly to the feast. These gluttons tore fiercely at the whale for days.

Draws a Comparison

"The shark and the swordfish hated each other with a bitter hate. They distrusted each other and would battle to the death to make a square meal out of each other if there were no easier food close by. But the whale was easy money, easy food, and they, these gunmen of the deep, took his life without a twinge of conscience. On the whale they developed perfect team-work, fine cooperation.

"It struck me at the time that the true parallel in business and politics today would be to depict the automotive industry as the leviathan of big business today, being speared by oil as a profiteer and gashed by the railroad interests which fears auto competition, while a host of predacious, cannibalistic lesser fry, such as rubber, lumber both soft and hard, aluminum, copper, etc., take their toll.

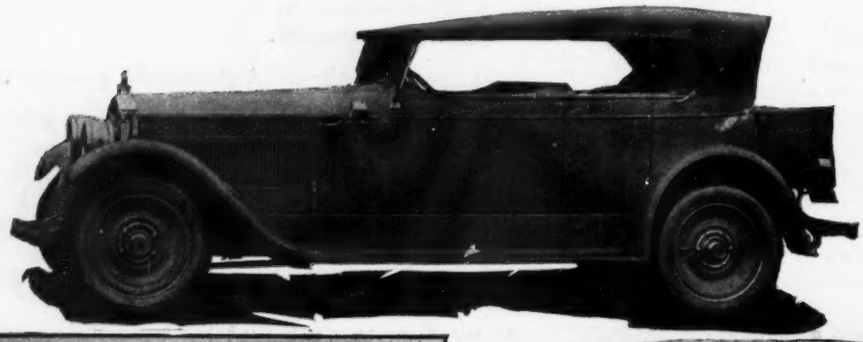
"All these special interests are old at the government game. Their creed is that government is to despoil the weak who cannot defend themselves and the strong who are unwary. They use the tariff and taxation measures generally to mulct millions wherever and whenever they can.

"What of the future?" he continued.

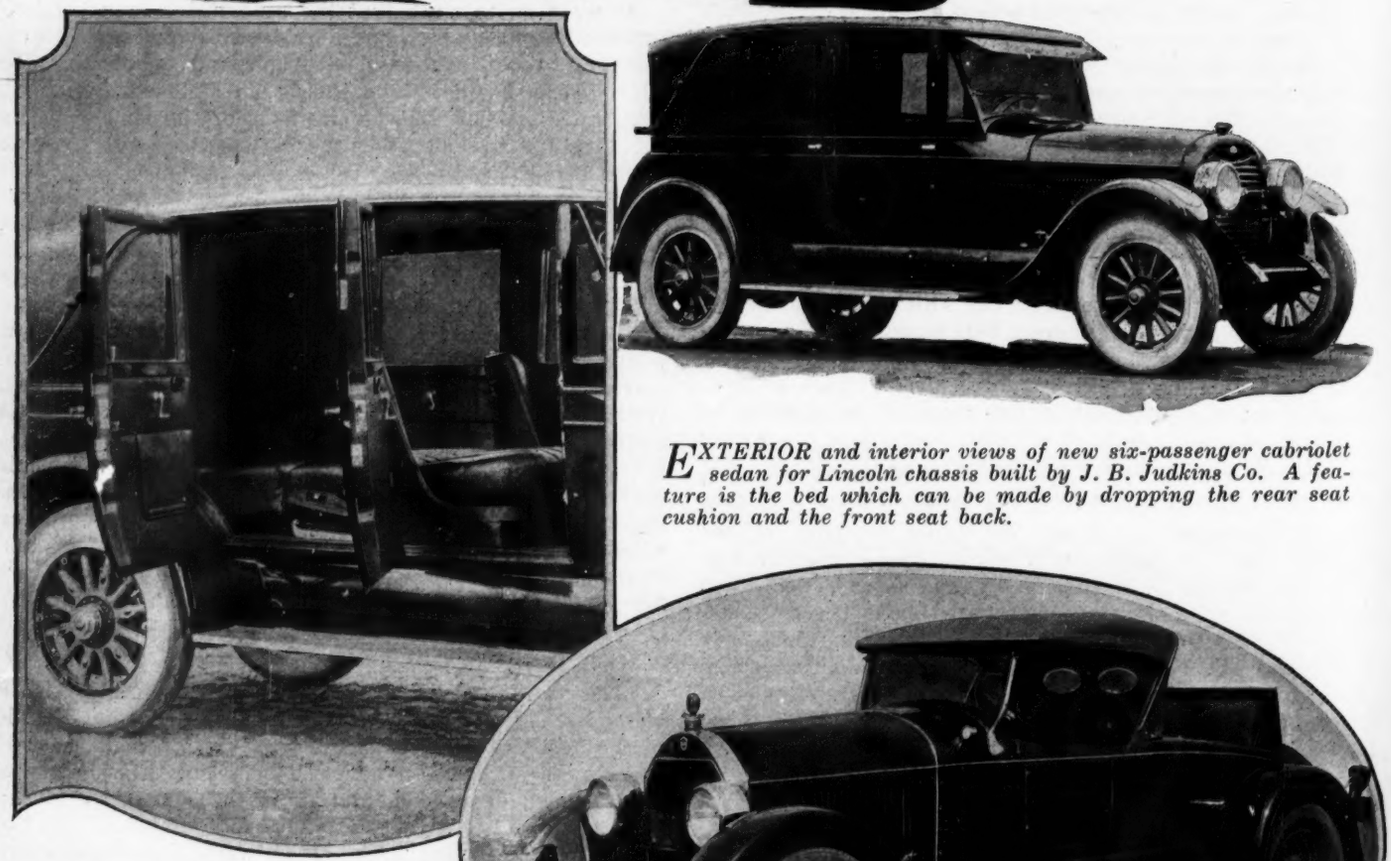
"Henry Ford told me at a football game last fall, in one of his serious moments: 'The main thing in life is to find out the right thing to do in any case.'

"Not what is the easiest thing to do, the most selfish, or the most sensational—just the right thing; then go ahead and do it though the heavens fall.

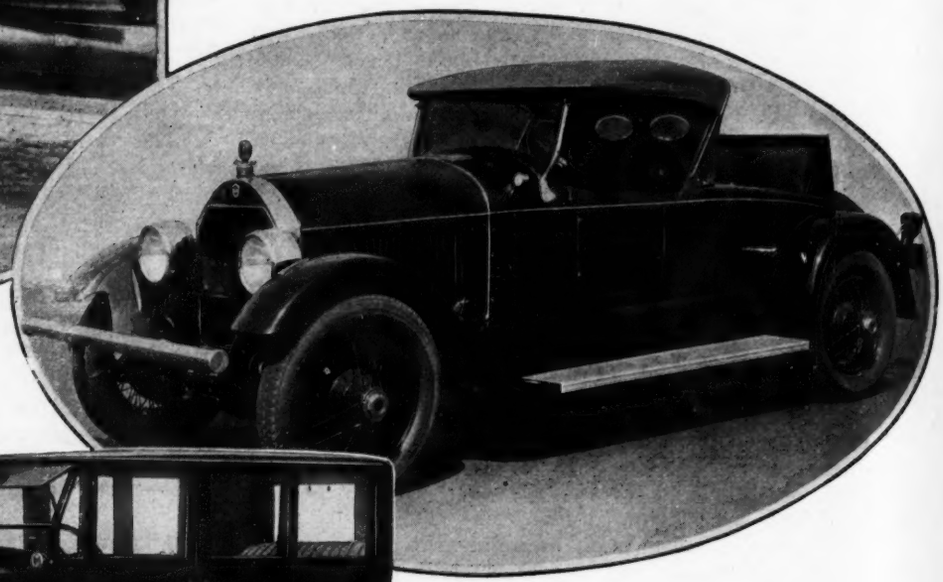
New Body Models Show Increased



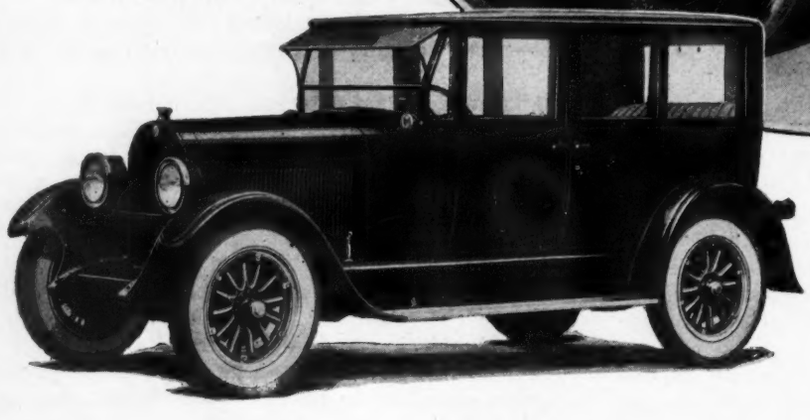
FLEETWOOD Metal Body Co. made this striking open body for a Packard chassis.



EXTERIOR and interior views of new six-passenger cabriolet sedan for Lincoln chassis built by J. B. Judkins Co. A feature is the bed which can be made by dropping the rear seat cushion and the front seat back.

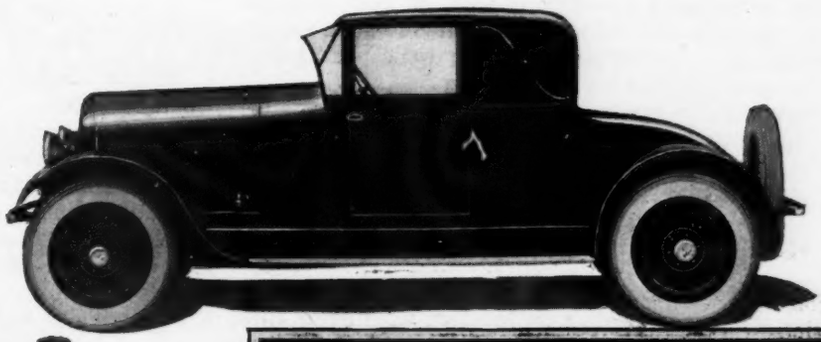


FIRST roadster built in this country using Meritas fabric construction. This is the product of the E. J. Thompson Co. and appears on a Stutz chassis.

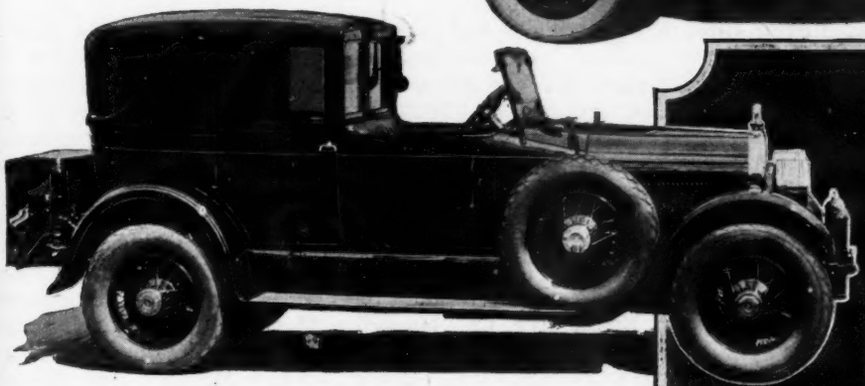


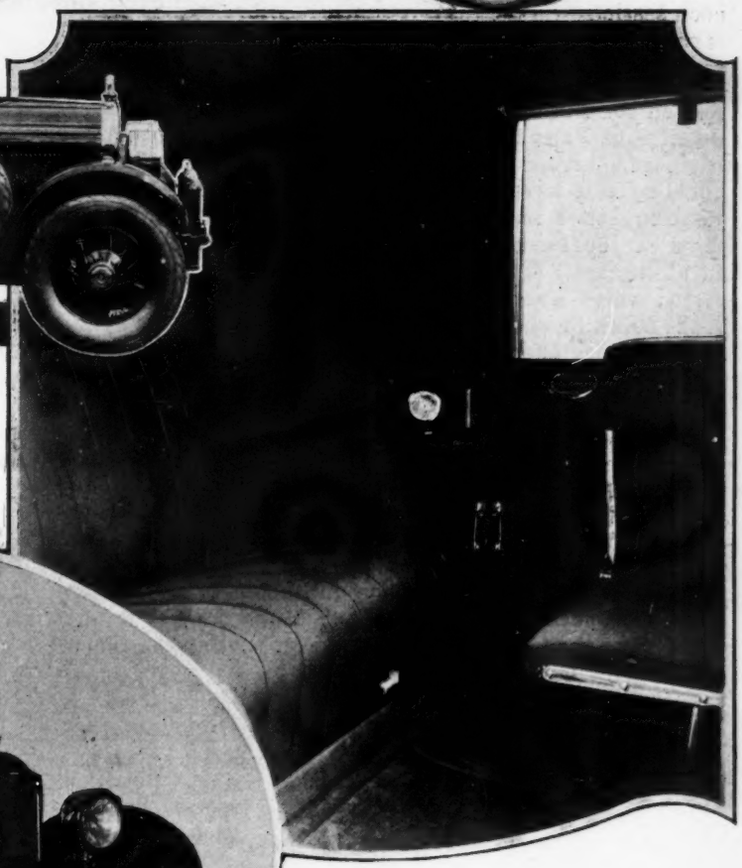
FIVE-PASSENGER sedan built for Peerless six by Baker R. & L. Co. One feature of this body is windshield construction with cast aluminum brackets carrying the windshield glass, visor and side lights.

Attention Being Given to Style in Design

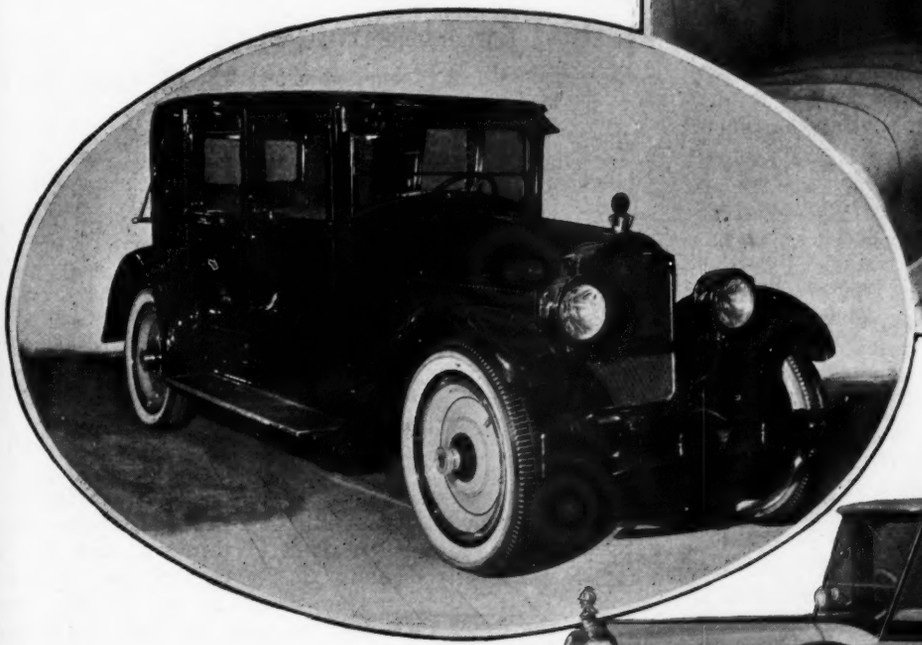


LE BARON coupe on Franklin chassis. Large opening for luggage is provided in the deck. So-called "vacuum" type windshield is used.

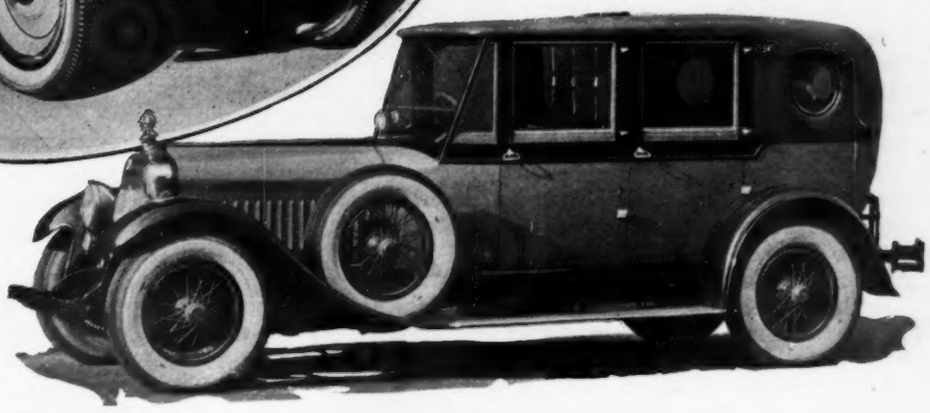




CADILLAC town brougham built by Willoughby Co. Note crown effect on front face of body. Right—The upholstery shown in the interior view is fawn colored plain broadcloth, while the interior woodwork is Circassian walnut.



SPECIAL all-metal frame body construction built by the Pullman Co.



ENCLOSED drive seven-passenger limousine on Minerva chassis. C. P. Kimball & Co. built this body, the roof and rear quarters of which are in brown leather harmonizing with the two-tone color scheme of the body.

"The right thing for the automotive industry and its various organizations to do is to protect the industry, and above all its customers, from hostile governmental action, from greedy, unscrupulous interests which have been using government to despoil; then on the converse side use government to develop the industry by good roads, fair shipping rates, scientific bureaus and the passage of laws for the general good of the industry.

"The automobile is inevitably and through no choice of its own in politics. In fact, it has been for some time. But now it is conscious of how much it has been losing, and how much it may gain. Why not make the most of it?"

Developments in Paint and Varnish

Automobile body finish was the sole topic of an afternoon session which was held in conjunction with paint and varnish manufacturers who were holding a separate convention at the same time. Four developments in the direction of producing brighter finishes that are more durable formed the subjects of the papers and discussions. L. V. Pulsifer of Valentine & Co. discussed the advancement in standard varnishes. Recent developments along these lines, he said, have made varnish materials more than 200 per cent better and reduced the time of finishing to one-third of the former requirement and results as regards durability are 100 to 400 per cent better. The two months' period which was required for the production of a high-grade coach finish has been reduced to ten days for standard varnishes and to two days for nitro-cellulose finishes. The latest Valentine finish which Mr. Pulsifer discussed has been described in detail in a recent issue of AUTOMOTIVE INDUSTRIES.

Duco, a pyroxylin or nitro-cellulose finish, was discussed by E. M. Flaherty of E. I. duPont de Nemours & Co., who first covered the details of the production of nitro-cellulose. In addition to the description of the material and its application, both of which have received considerable space in this publication, Mr. Flaherty presented some interesting figures covering the cost of finishing bodies with this material at the plant of the Oakland Motor Car Co. These figures are tabulated as follows:

Type of Finish	Actual Labor, Hours	Labor Cost	Total Hours Production Time	Floor Space Requirements, Sq. Ft.	Bodies in Process	Percentage of Rejection, Per Cent
Varnish	6.728	$2.30	236	101,000	2400	20
Duco	5.715	2.26	13.2	73,000	600	2

The total hours of production time has been increased somewhat since this process was described previously in AUTOMOTIVE INDUSTRIES. Mr. Flaherty accounted for this increase by explaining that the additional time is devoted to polishing, with the result that a gloss which practically is the equivalent of that of a varnish finish is obtained now.

Under the title of "High-Bake Enamels," a paper describing the Oxvar system of enameling was read for A. I. Stevens of the Oxford Varnish Corp., who was unable to attend. C. R. Bragdon of the Ault & Wiborg Varnish Works spoke on Low-Bake Enamels, describing the material which is now in use at the Olds Motor Works. Both of these finishes have been described in considerable detail in recent issues of AUTOMOTIVE INDUSTRIES.

At the executive session of Wednesday morning officers for the following offices were elected:

President, James A. Daugherty, Robbins Body Corporation.
First vice-president, W. H. Ritter, English and Mersick.
Second vice-president, R. Johannesson, Textileather Co.
Third vice-president, R. C. Gelzinger, Gelzinger-Fox Co.

Executive Committee

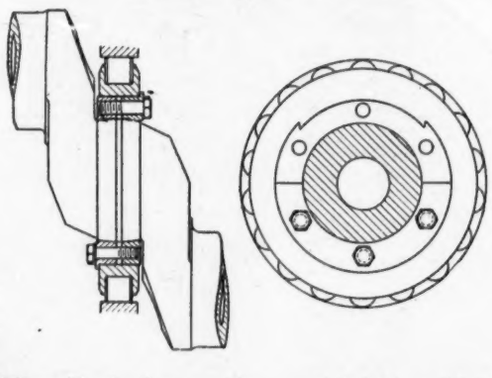
Chairman, John B. Judkins, John B. Judkins Co.
Gordon F. Fairgrieves, Towson Body Co.
D. E. Humphrey, Ternstedt Manufacturing Co.
H. Millspaugh, Millspaugh & Irish Co.
C. G. O'Dell, Black & Decker Manufacturing Co.

At this session a proposition to amend the by-laws of the association to allow the inclusion of car manufacturers as members was submitted to the new officers for final action. It also was decided to forego extensive exhibits at the November Salon and the annual New York Show, but to hold a dinner or luncheon during the period of both events. In addition to the various general and executive meetings, an informal dinner was held at the Hotel Statler Monday evening.

Following is a list of those who exhibited at the show:

Allied Metal Products Corp., American Forging and Socket Co., The Atwood Vacuum Machine Co., Autobody, The Automobile Trimmer and Painter, The Black & Decker Mfg. Co., Boyriven, Inc., A. S. Campbell Company, Chicago Curled Hair Co., Continental File Corporation, Detroit Rubber Products, Inc., Dictograph Products Corp., Drying Systems, Inc., Duratex Corporation, Eagle-Ottawa Leather Co., The Eberhard Manufacturing Co., Elliott Manufacturing & Plating Co., The English & Mersick Co., Ferro Stamping & Manufacturing Co., General Aluminum & Brass Mfg. Co., Haskelite Manufacturing Corp., L. J. Houze Convex Glass Co., The Laidlaw Co., Inc., Manning Abrasive Co., Inc., Motor Vehicle Monthly and Motor Vehicle Annual, Murphy Varnish Company, National Seal Company, Inc., Parsons Manufacturing Company, The J. D. Randall Co., B. E. Taylor Mfg. Co., Textileather Company, Valentine & Company, Wm. Wiese & Co., Inc.

Method for Mounting Roller Bearings on the Crankshaft



A NEW method of mounting anti-friction bearings on the intermediary journals of a crankshaft has been patented in England by G. S. Wilkinson and M. S. Napier. Where the bearing has to be stripped over the crank arms it has been the custom to use a filler ring between the inner race and the journal, this ring being made in halves in order to be able to get it into place, and usually prevented from moving endwise on the journal by means of a distance collar, also made in halves.

In the design of Messrs. Wilkinson and Napier two spacer rings are used, each made in halves, these rings having tapered internal surfaces which bear on correspondingly tapered surfaces of the journal. The rings are drawn together by means of cap screws which are so disposed that their heads clear the crank arms on opposite sides.

United States' Foreign Trade Amounts to $22,650,000 Per Day

Development of exports is essential to growth of industry, James A. Farrell tells the National Foreign Trade Council. Overseas advertising discussed.

By David Beecroft

WHEN the Eleventh National Foreign Trade Council Convention was opened in Boston with the startling statement from James A. Farrell, president of the United States Steel Corp. and chairman of the National Foreign Trade Council, that "for the last ten years our foreign trade has been at the rate of $22,650,000 per day," many of the 1500 delegates received a fresh realization of how the foreign trade of this country has developed in the last decade, stimulated above normal, of course, by the war.

All industries in America not only must continue their foreign trade, Mr. Farrell said, but must work actively to develop it more generously. The fact that we need raw materials from foreign lands to carry on our industries is a primary reason why we must work aggressively and diligently to sell our manufactured products abroad. The largest industries in our country are dependent for their very existence on the supply of raw materials from overseas.

Last year 30 per cent of our total imports consisted of four such essentials as crude rubber, raw silk, coffee and cane sugar. Three of these cannot be produced in the United States, and the fourth, cane sugar, is produced only in very limited quantities. Two of these raw materials are essential foods while the others are essentials of industry. Consider how we depend on these four, Mr. Farrell went on:

Consider Rubber and Silk!

There are 500 establishments in the country for the manufacture of rubber goods in which imported raw material is used.

There are 1325 silk plants in the country making use of raw silk.

Together these two industries—rubber and silk—employ 250,000 workers.

These workers earn more than $200,000,000 per year.

There are thousands of uses of rubber and hundreds of uses of silk which are essential to our way of living, and there are many of these uses we could not dispense with unless we chose to endure a distinct lowering in our living conditions.

There is a long list of other raw materials needed in our daily life that must come from foreign lands. They are utilized through the whole range of industry which furnishes occupation direct to thousands of our workers. Products manufactured from these raw materials administer to the comfort, convenience, amusement and necessity of every person in this country every day.

Mr. Farrell quoted statistics showing that in 1923 values of food products imported by the United States exceeded by $70,000,000 the value of those exported. We imported $892,368,000 worth of food products.

Last year we imported raw materials of industry to the value of $2,108,325,000. This represented 50 per cent of our total imports.

Last year our imports of foodstuffs and raw materials for industry totaled $3,000,000,000 out of total imports of $3,701,000,000.

These and similar facts led Mr. Farrell to express himself in such unqualified terms regarding the necessity of giving primary consideration to foreign trade. Here are his words:

Foreign Trade Is a Necessity

"Foreign trade is an economic necessity. It is not merely within the scope of our convenience or preference. It is the principle of human need. . . . Conditions of daily life impel us to maintain foreign trade in order to keep our people remuneratively occupied and to supply them with the things they need and want.

"Steady occupation for all our people is a fundamental rule of prosperity. Occupation means production, and we cannot have prosperity unless we are able to sell substantially all of our production. It is the sale of the last 10 or 25 per cent in any line of production which makes the whole operation profitable."

Figures given by Mr. Farrell indicate the rapid growth of our foreign trade in the last two decades:

Twenty years ago 90 per cent of our exports were manufactured by fewer than 20 companies.

Today 100 of our chief exports made by many more manufacturers represent only 85 per cent of our total export volume.

Last year Cuba, with a 3,000,000 population, purchased from us at the rate of $44 per capita. We bought largely of her sugar and tobacco in return. Bolivia, on the other hand, with the same population, purchased only at the rate of $1 per capita. Yet Bolivia has enormous resources of raw materials which we need but which are as yet largely undeveloped because we have very small financial investments in Bolivia, whereas our large financial investments in Cuba have helped that country to develop its industries, from which we make profits by virtue of our foreign trade.

At the end of three days of sessions the spirit of Mr. Farrell's remarks was caught by the resolution committee, and was expressed in the following resolution relating to the national necessity of foreign trade:

"There should be developed among the American people a solidarity of will and a unity of purpose to promote the maintenance of our foreign trade. That should be our settled and determined foreign trade policy.

"In our domestic industry we have developed four great factors of enterprise, namely, production, transportation, communication and finance, to the point of highest efficiency, but in our foreign trade there is still

necessity for effort on all of these lines. It is important to reduce cost of production to the lowest possible point so as to meet the competition of low cost of production of other countries. It is equally important to stimulate the development of American ideals in transportation, communication and finance to the point where they can meet on a plane of competitive equality to similar services rendered by foreign systems."

The influence of the present condition of Europe on our foreign trade, which has been a dominant subject of the annual foreign trade conventions for five years, was touched upon by several speakers.

Mr. Farrell thinks we ought not delay foreign trade activities until the return of European prosperity. He believes there is no information upon which we can base an assurance that the European market can be restored within a stated time and that the economic interests of Europe may eventually lie in directions antagonistic to our own. We cannot retire from foreign trade just because Europe is not able to buy from us at her accustomed rate, Mr. Farrell said. As our requirements in raw materials increase, Europe's ability to supply them diminishes, and so we must look to other places for raw materials. This is a very important factor of our export situation today.

Keen Interest in Germany

Germany is the country of greatest interest in the European situation, according to several of the convention speakers. Fred I. Kent, vice-president of the Bankers Trust Co., New York, who has studied carefully the German situation, gave a very lucid explanation of the Dawes plan and told how he thinks it will work out. Mr. Kent has spent many months in Europe each year during and since the war and has discussed the recuperation of Germany with the financial and industrial leaders in all European countries. He believes that unless the principles of the Dawes plan, approved by the Reichstag only a few hours before his address was made, can be put into practical operation a very serious situation will result.

Germany has come through one money crisis, and has stabilized temporarily her currency by the Renten mark (a trillion paper marks is the exchange basis for one Renten mark), but this stabilization will not prove permanent unless the Dawes plan principles go into force. Otherwise Germany cannot pass through another money crisis similar to the one she is emerging from.

Mr. Kent is emphatic in his contention that American business men must understand the fundamentals of the Dawes plan. Here are a few paragraphs on it:

The capacity of German factories in all lines of industry is much ahead of the pre-war capacity and the machine shop equipment of today cannot be compared with that of pre-war days because of its superiority.

German railroads are in a much better condition than in pre-war days, so far as roadbed and equipment are concerned. Vast sums have been spent in their improvement and the pre-war indebtedness against them was paid off during the period of depreciated currency. The railroads today are valued at 26,000,000,000 gold marks and have an earning power of 1,000,000,000 gold marks per year.

The fundamental objective in the Dawes plan is to insure reparation payments from Germany in gold marks and to accomplish this by tying up German industries and the German railroads as major factors in the plan, as well as having the German Government provide a definite amount of reparation by general taxation.

The Dawes plan places a mortgage of 5,000,000,000 gold marks on German industries and arranges for 6 per cent interest on this yielding 500,000,000 gold marks per year. This is the contribution of industry to the reparation payments.

From the railroads 1,000,000,000 gold marks per year should come.

The Dawes plan also embraces a new German bank with a capital of 400,000,000 gold marks.

The $200,000,000 German loan, which it is said will be made this fall in England and America, will be deposited in this bank and thereby be under the control of the Allies.

The Dawes plan sets up the necessary machinery by which Germany can pay in gold marks and should be considered a compromise scheme so designed as to meet the complicated needs of the different countries in Europe.

Another expression on the German situation came from Basel Miles of the International Chamber of Commerce. He described Germany as a country of great economic strength and one that should be taxed to the same extent that the allied countries now are being taxed to meet its reparations. Germany has not been so taxed up to the present.

German factories are in admirable condition; so are the German railroads and the German telephone systems.

During 1923 Germany was the third best customer of U. S. goods and purchased $316,000,000 worth from the U. S. A.

The action of the Reischtag in approving the Dawes plan with minor reservations indicates the determination of Germany to put itself on its feet and this determination should act as a good stimulant to other European countries.

W. F. Earles, manager, advertising department, U. S. Rubber Export Co., New York City, was one of several who made the session on export advertising appropriations of unusual interest. Mr. Earles championed the decentralized method of controlling foreign advertising, the proponent of the centralized system being Paul R. Mahony, director of foreign sales, the Wahl Company, New York, manufacturers of the Eversharp pencil.

Decentralized control of foreign advertising, the method used by the U. S. Rubber Export Company means that instead of the home advertising department saying how the advertising appropriation for any and every foreign country shall be spent these important matters are left in the hands of the branch sales agents or distributors controlling the business in the respective countries.

Centralized Advertising Control

With centralized control of export advertising as used by the Eversharp concern the home advertising department in New York City decides not only the amount of appropriation for the different countries, but the copy to be run, the arrangement of schedules, in short, everything connected with the work.

Each system, centralized and decentralized, has its advantages and disadvantages. Where a single product of simple character such as the Eversharp pencil is advertised, the centralized system is best. It is possible for the advertising department to direct every detail of the advertising from the home office. The appeal of such a product is the same the world over and is not influenced on account of fluctuations.

As Mr. Earles explained, the advertising of the U. S. Rubber Export Company is entirely different, constituting a most complicated line of advertising because of the varied character of products sold in different countries. These products go to widely different industries; some of the lines are seasonal and others not seasonal. Under the decentralized system used, each foreign branch controlling an entire country, or a distributor controlling the country, is required to make a report each October, making recom-

mendations as to the advertising appropriation necessary in the next 12 months, together with a schedule of recommendations as to the amount to be spent for each line of merchandise and also the publications to be used and other methods calling for appropriation.

These recommendations from the different countries are considered and necessary action taken. Appropriations for the different countries are generally 2 per cent of the turnover for the branch. With the distributor the policy usually is a fifty-fifty one. The U. S. Rubber Export Company permits its distributor to spend 2 per cent of the net purchases from it and frequently this percentage is higher. The distributor must furnish monthly statements including copies of ads, receipted bills, etc. Branches must make monthly reports of all advertising done, including copy and receipted bills. To assist the foreign branches in their advertising work, copies of all domestic advertisements are furnished.

Decentralized System Is Not Perfect

U. S. Rubber Export Company is not entirely pleased with its present decentralized system but it is proving more satisfactory than any that has been used.

Carl F. Propson, manager sales promotion department, Bausch & Lamb Optical Co., gave some good advice on making export advertising appropriations based on an investigation he conducted with several companies in different industries. In his investigations, Mr. Propson was not able to discover any definite method for determining the size of the export advertising appropriation. The size of the appropriation largely depends on what has to be accomplished, whether the aim is to reach importers, to reach dealers, or reach consumers. There are three general methods for deciding on foreign advertising appropriations:

1—The appropriation may be based on the volume of business done during the past year.

2—The appropriation may be based on the volume of business expected during the coming year.

3—The appropriation may be an arbitrary one, depending solely on the idea of the company as to what can be spent.

Some concerns operate on a budget system in arriving at appropriations, and the appropriation is made a percentage of the total selling cost.

Appropriations on a Five-Year Cycle

One New England manufacturer works on a five-year cycle in making his appropriations that he will not be influenced too much by the rise or fall of export business. Working on this cycle he reduces advertising when business is good and increases it when business is poor. Several other representatives of national manufacturers agreed with Mr. Propson on the five-year cycle and on the policy of decreasing advertising when business is good and increasing it when business is poor.

The only times when arbitrary appropriations should be made for export advertising is when work is being started in a new territory or when you have to keep the appropriation as low as possible.

In considering foreign advertising Mr. Propson divided the work into two broad divisions:

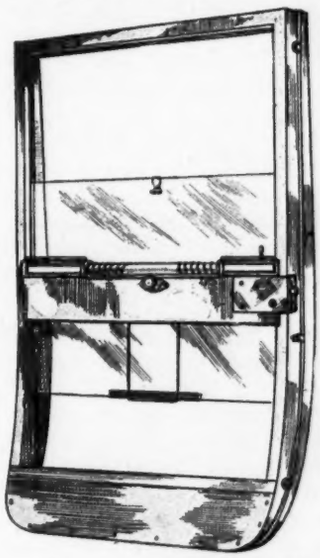
Division 1—Primary advertising placed to help move the goods from the factory to the shelves of the importers in the foreign countries.

Division 2—Secondary advertising placed to help the importer move the goods from his shelves to the retailer and to the consumer. In the first division business papers are considered successful by the majority of national advertisers but daily and weekly newspapers are considered best for reaching the consumer. Only in a few industries are there export magazines which reach the retailer as well as the importer.

Window Lifting Device Works Similarly to a Shade Roller

A NEW window lifting device which was developed abroad has been placed on the American market recently by the Rawlings Company of America, Ltd., 1819 Broadway, New York. It works on substantially the same principle as the ordinary window shade roller, being concealed just below the sill of the car window or door.

Attached to the bottom of the glass window and wound around the spring roller are two strands of small silk-covered steel cable. At the top of the glass it attached a small knob by which the window may be lowered or raised, a spring in the roller providing an even tension. A slight turn of the milled knob just below the center of



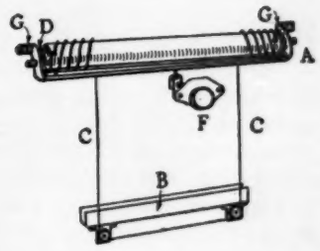


Fig. 1—The complete door
Fig. 2—The two rubber-tipped brakes which hold the window in place are shown in this cross section
Fig. 3—The complete installation: A, roller axle; B, channel for bottom of glass; C, silk-covered steel cables which wind upon the spring roller; D, tension adjuster; F, knob which operates the brake; G, rubber-tipped brakes which press against the glass

the window sill checks the motion of the window and holds it secure in any desired position, by means of two rubber-tipped brakes.

The new lifting device is to be made in this country, and President J. H. Rose of the company announces that production here already has begun.

IT is proposed to build a private toll road for fast motor traffic between London, Manchester and Liverpool. Speaking on the subject at a conference recently held at Newcastle-under-Lyme, Lord Montague of Bealieu said that even with the present limited motor equipment in England three times as many people travel by road as by railroad. In spite of the enormous developments of the past hundred years no new trunk lines had been built, and in some instances the count got along on the roads built by the Romans. He estimated that the saving in fuel, tires, brake lining and time represented by an unchecked run would be 2 cents per ton-mile.

Packard Bodies Assembled in Metal Jigs to Minimize Hand Fitting

Production methods similar to those used in chassis manufacture are employed in putting together wood frames and units from which they are constructed, resulting in consistent accuracy in dimensions and material decrease in time required to fabricate.

As a part of an extensive program which has for its object the establishment of body production upon the same engineering and manufacturing principles as apply to the metal parts of the powerplant and chassis, the Parkard Motor Car Co. already has a number of all-metal body assembling jigs in operation. Use of this type of jig is being increased as rapidly as the consideration of design and installation will permit. At present this type of jig is being applied to the assembly of the sills, seat boxes and cross members of the floor assembly, to the frame assembly of the seven-passenger sedan and sedan limousine bodies, to the assembly of closed car door frames and metal panels and to the seven-passenger open bodies.

While some of this development is the outgrowth of the use of the older type of wood bucks and jigs, a considerable advance has been made by the application of machine shop rather than wood shop ideas.

The best ideas of this school have been combined with production ideas of the mechanical department. As a consequence, it now is possible to assemble body and door frames at a greatly increased rate of speed. At the same time the element of consistent quality or accuracy of dimension which attends the new method has reduced hand working of wood parts, shearing and bumping of metal work and door hanging to a practical minimum.

Sedan Body Frame Assembly Jig

Two outstanding examples of the all-metal jig development are the seven-passenger sedan and sedan-limousine body frame assembling jig and the sill assembly jig in which the lower assembly is prepared for the former jig. Fig. 1 illustrates the sill assembly jig with the complete floor assembly or base in place. Many of the clamps and drill bushings with their brackets are also shown.

At the beginning of the assembly, the two sills are placed on the jig, being located by hardened steel index blocks and retained by quick-acting eccentric clamps. After the sills are locked in place, jig brackets are swung into their proper locations and the holes for practically all of the subsequent unit assemblies are drilled. Following this, the seat boxes and cross pieces which have been built up as unit assemblies are set on and then glued and screwed permanently in place. The base assembly is then ready for delivery to the body frame assembly jig.

The base assembly jig consists of a cast-iron frame which is finished over the top to the contour of the lower surface of the sills. This frame is supported by a pipe standard at each end, the pipe sections terminating at the lower end in flanges which are lagged to the floor. The drill bushings are hardened, as in machine shop practice, as are all of the locating surfaces. Forged steel brackets, which carry the individual bushings, are hinged at the cast-iron base and locked in the working position by eccentric clamps. This type of clamp has been utilized wherever possible due to its rapid, positive action.

Closed Body Assembling

Similar features of construction are found in the closed body assembling. Fig. 2 shows the jig in the empty condition. A heavy cast-iron base supports four pipe columns, which in turn support the superstructure of standard steel sections.

Locating blocks and clamps are fitted to the base for the accommodation of the base of the body frame. The rear columns shown in the foreground of Fig. 2 carry swinging arms which locate the rear corner pillars while the superstructure carries two swinging fixtures at each side for the windshield frame and door posts. Another swinging fixture at the rear end takes care of the rear panel.

Hinged eccentric clamps for the purpose of drawing down the top also are carried by the superstructure. Aluminum castings are used for the swinging members that are hung from the top. Wherever locating points, drill bushings or clamping surfaces are necessary, hardened steel blocks are bolted on to prevent wear. All of the swinging fixtures are counterweighted so that they are out of the way until required. The top clamps are withdrawn by springs.

In operation, the body base, as completed in the jig illustrated by Fig. 1, is placed in the assembly jig, Fig. 2, and clamped by the four eccentric clamps which are shown in the foreground. In ordinary operation four men are engaged at the assembly operation.

Corner and door posts are next inserted and held by the swinging members at each side. Each post is held in the correct position by three locating blocks and at least one clamp, the provisions for the front corner post being shown in the center foreground of Fig. 4. The rear corner posts are held in place by the brackets which rotate on the rear standards of the jig. After this portion of the body is in place, electric drills are used for spotting wood screw holes at the various joints, the location being determined by the drill bushings in the various members of the jig.

Following a similar routine, the rear hinged member is swung down for the location of the back panel. Braces, whether stamped or cast metal or wood block, are located by hand and glued and screwed into place after the members of the body have been fastened at the joints

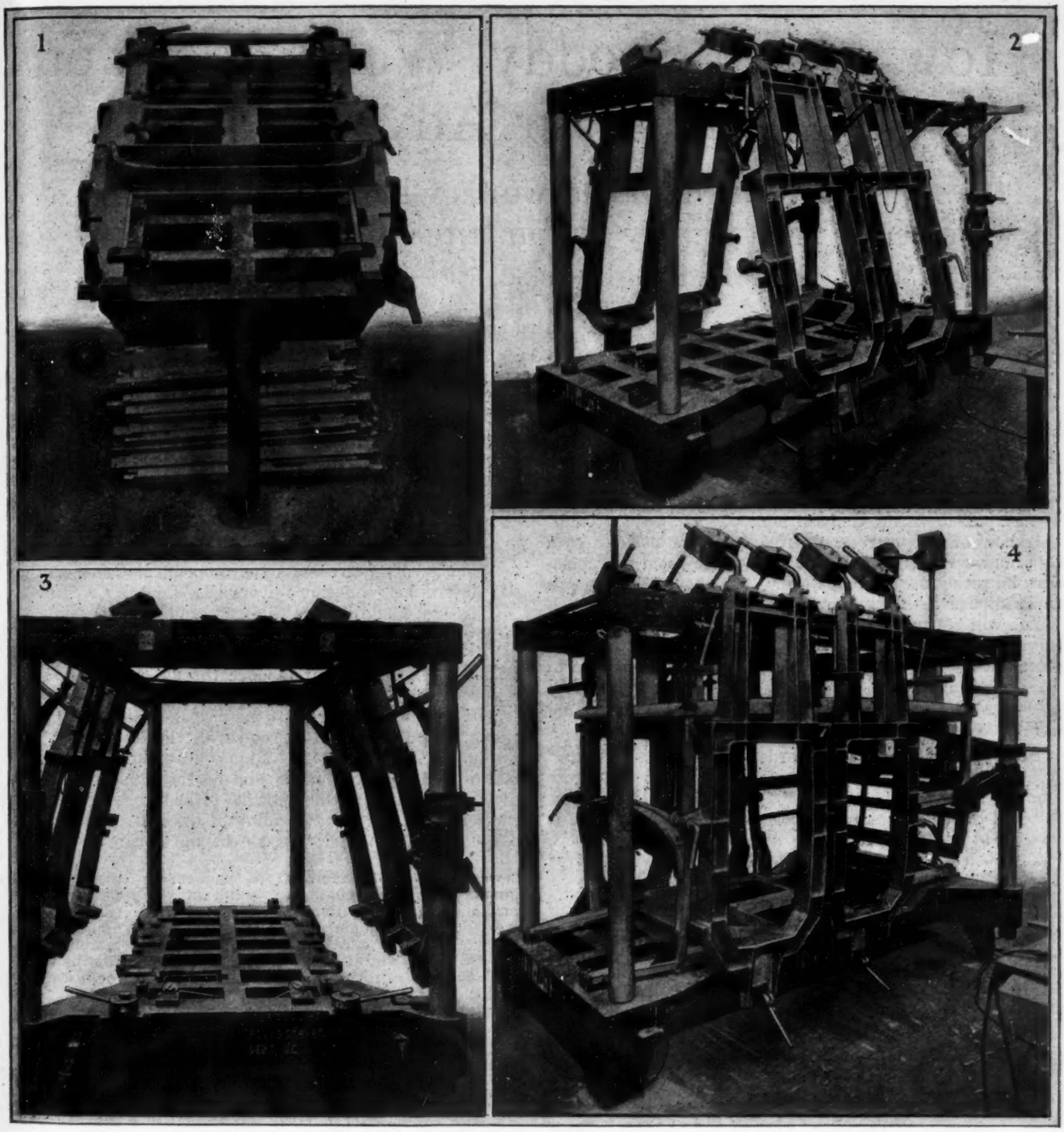


Fig. 1—Assembly fixture for 7-passenger closed body bases showing completed base in place. Fig. 2—Rear view of 7-passenger closed body frame assembly jig. Fig. 3—Closed body assembling jig as viewed from the front quarter. Base is cast iron, columns are pipe and swing members are cast aluminum. Fig. 4—Complete 7-passenger sedan body frame with all members of jig in working position

proper. The vertical posts are set into the sills as shown at the front corner post, but due to the preliminary jigging of all work, practically no fitting is required to make the posts fit in both the notches in the base and the locating points on the jig members.

When the dash assembly and side frame members of the body have been fastened in place, a complete top frame of the slat type is slid in just under the jig superstructure after glue has been applied to the various mortise surfaces. In spite of the fact that there are at least eight mortise joints between the top and the side structure, the accuracy of the assembly and the workmanship on the various units is such that no fitting is required and the top is pressed into place by a row of hinged clamps at each side.

On the open body line a jig of similar design is used for the assembly of seven-passenger bodies; closed body top frames are assembled in a jig similar in principle to that illustrated by Fig. 1. Similar types of construction are in use for the pillar, dash and back panel assemblies. The body line is taking on more of the aspects of the usual mechanical assembly line.

How Many Shoddy Words Do You O. K. in Your Advertising?

Here is a list of one hundred words which have been used so often in copy, singly and in trite combinations, that they have lost all concise, definitive meaning.

By Richard Surrey*

A FEW days ago I was engaged on a piece of copy. It has been rewritten two or three times. At last, after a few further changes, I had it typewritten, put it in my pocket, and went home. It was a special piece of copy, and I wanted to see if it would stand up under a severe test.

After dinner I read one of Tchekhoff's short stories. Then I pulled out my composition.

I know of no severer test, for Tchekhoff never uses a superfluous word; and, if one may judge from a translation, he rarely uses a long word. But, above all, he seems never to use a thin word.

You will get an idea of what I mean by "thin" as applied to words when I give you five samples, cut out of my special piece of copy as a result of the Tchekhoff test. They were:

incalculable
imperative
conditions
maintained
adequate

Tchekhoff never used such words. His is not a "literary" style in the usually accepted sense of the term. He wrote humbly. He tried to set down as directly and simply as he could the things he remembered, and that is why he is such good medicine for copy writers, who, like myself, feel impelled to strain at subtle distinctions, and often lose the substance in groping for the shadow.

Here is an average sample of his easy, straightforward style:

Tchekhoff's Words

"As he went back to the fire, the deacon imagined the church procession going along a dusty road on a hot July day; in front the peasants carrying the banners and the women and children the ikons, then the boy choristers and the sacristan with his face tied up and a straw in his hair, then in due order himself, the deacon, and behind him the priest wearing his *calotte* and carrying a cross, and behind them, tramping in the dust, a crowd of peasants—men, women and children; in the crowd his wife and the priest's wife with kerchiefs on their heads. The choristers sing, the babies cry, the corncrakes call, the lark carols. . . . Then they make a stand and sprinkle the herd with holy water. . . . They go on again, and then kneeling, pray for rain. Then lunch and talk. . . ."

When you put a piece of ordinary advertising copy beside *that* it takes only a second to find out what is wrong with it. At least, it took me no longer to decide what was wrong with mine. It was inflated. It was so blown up and *stretched* and thin that I was heartily ashamed of it. I was especially ashamed of the five words I have pilloried above. At the office, in the atmosphere of advertising, they had not seemed out of place. At home, with Tchekhoff's simplicity so freshly impressed on my mind, they disgusted me.

"Do I use more words of that kind than the average copy writer?" I tremblingly asked myself. Two or three magazines were lying handy. I picked them up and began to thumb through their pages. My nervousness subsided. I ran into phrases like this:

Calls Attention to Phrases

"Your own requirements for economical transportation will determine your choice of models."

"The responsibility for this outstanding leadership is a mighty one and is insistently maintained by. . . ."

"And the minimum service cost continues these economies in inexpensive maintenance throughout all the years it serves you."

As I went on it occurred to me to make a list of fifty thin words, and I began to jot down all the long, thin, dead words that I came across. I must have skimmed through 200 or 300 advertisements, and at the finish, instead of fifty words, I had 100, quickly picked because of their endless repetition in advertising of the most various products. Here is the list, just as the words came:

thoroughly	dependability	economical	gratifying
standard	reliable	maintain	essential
performance	prevention	adequate	sufficient
greatest	fundamental	exceptional	duplicated
important	absolutely	quality	justifies
results	initial	recognized	demonstrate
approved	utility	protection	facilities
effective	excellence	achieving	unusual
indispensable	significant	convenient	exclusive
conservation	discriminating	specialized	incomparable
developed	available	experience	invariably
ideal	construction	practical	materially
contribute	remarkable	feature	possibilities
appreciate	genuine	distinctiveness	innumerable
conditions	popular	high-grade	expert
requirements	exceeded	durability	revealed
moderate	endorsed	satisfaction	atmosphere
imperative	opportunity	unique	cultured
unequaled	solution	invaluable	characteristics
discover	harmonious	factor	investment
problem	overcoming	guaranteed	scientifically
maximum	creative	enhancing	operation
service	embodied	equipped	conspicuous
designed	assured	efficiency	superlative
fascinating	wonderful	eliminated	outstanding

I said to myself: "I shall memorize these words and never use them in a piece of copy again unless I have to. I'll have them typewritten on cards and carry them about with me, as a sort of pocket 'chamber of horrors.'"

Apart from their context, of course, where two or three were often strung together in one phrase, some of these words may not appear so very "horrible." And none of them, thus separated, seems so common and irritating as

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when one has just gone through 200 or more advertisements and found them so often repeated.

A list of proscribed words now in use by the *Century Magazine* has a tendency almost opposite. In most instances the words listed are condemned because they are needlessly long, roundabout, inexact and inexpressive. For example:

affair for *thing*
aggravate for *annoy*
aggregate for *total*
claim for *assert*
commence for *begin*
conscious for *aware*
couple for *two*
donate for *give*
individual for *person*
infinite for *great, vast*
liable for *likely*
materially for *largely*
mutual for *common*
partially for *partly*
position for *place, office*
prior to for *before*
realize for *obtain*
subsequently for *afterward*
transpire for *happen*
universal for *general*
vicinity for *neighborhood*

This extract, like my own hastily compiled list, indicates a preference for Anglo-Saxon words over Latin and Greek derivatives. If you will glance back at the hundred thin words, you will note that the greater number of them are also of Mediterranean origin.

Allen Upward has expressed probably the strongest detestation for what he calls "dog-Latin" and "Babu-Greek" words, and excuses them only in scientific books on the grounds that there is "a subtle elegance in naming fossils in a fossil tongue."

"Most words," he says, "have taken shape by coming into touch with outside sounds, and with the sights and scents, the tastes and touches, that go together with the sounds. . . . In this way there is in every word a native element of feeling or a mark set on it by the world of sense, which cleaves to it through whatever uses it may pass and change. The word may be abstracted and refined away, till it appears like a balloon in the air; but still it will be a captive balloon, attached by some root meaning, as by a cord, to the firm earth beneath."

The advertiser whose appeal is to the masses should employ those words that are least inflated. If he will apply the Tchekhoff test to his copy, and concern himself more deeply with "the tastes and touches, the sights and sounds and scents" that penetrate most easily and forcefully to the minds of the mass, he will find himself instinctively choosing those words that are closest to their roots.

Colloquial speech and the stretching of words to advertising usage are causing similar changes, generalizations and corruptions at the present moment. The word *proposition*, for instance, is going through the identical process that degraded the word *thing*, and has been so flattened as to serve almost as its synonym.

When a merchant writes—"these values cannot be *duplicated*"—he does not mean that they cannot be *doubled*. He means that they cannot be *matched*.

Such words as *service, facilities* and *guaranteed* have been saddled by advertisers with so many meanings and ridden on such various errands that their backs are completely broken. They mean next to nothing.

Practice and *performance* have been hopelessly crippled by the manufacturers of automotive products. In my search for thin words I came across this phrase:

". . . a distinct departure from previous motor car practice and performance."

The advertisement from which I quote, unlike many others that use this kind of phraseology, did give some account of the "departure," but such a mouthful of thin, Mediterranean monstrosities would never have been placed in the first paragraph of a mass-appeal advertisement by anyone who had used the Tchekhoff test.

The prize exhibit, however, with its identifying marks carefully removed, is as follows:

"To you who use . . . the phrase (a slogan follows) is a promise—but to the skilled craftsmen who produce the . . . it is an *inspiration*, an *injunction* and an *ambition*."

This is beyond comment; but take such phrases as "Test it for easy operation, for mechanical efficiency," or "Of the many contributions to the comfort and convenience of the American home ———— is most distinguished." They would not be written, I feel sure, if advertisers were aware how often such words as operation, efficiency, contribution, convenience, distinguished and their like are used in advertising. If they *were* aware of the commonness of words of that kind one would not find a product described as "outstanding in this combination of fineness with economy."

Fineness and economy are two of the commonest words in modern advertising. That anyone could imagine them capable of producing an outstanding effect is a proof that some advertisers never read any advertisements except their own. It seems hardly necessary to add that even though an *outstanding* effect could be produced it would defeat its own purpose, for there is scarcely a product under the sun that has not been labeled with *that* adjective at some time or another.

THE author of this article is a copy writer who devised a test, applied it to his own copy and found it wanting.

And finally, what can be said of this collection of senile, rickety words?

"Its unique qualities of beauty, cleanliness and durability, obviating the necessity for . . . make . . . an investment, not an expense."

Anyone who has taken the trouble to glance at even fifty advertisements knows full well that if there are three qualities perpetually tooted in current copy that are *not* unique they are precisely the qualities of beauty, cleanliness and durability.

And even if they could be called unique, who would wish to call them so, except a person so young as to be excusably ignorant of the death and burial of this doddering old wreck of a word, years ago.

Let us all take Professor Saintsbury's advice and leave such words to "bleach" themselves by time's kind office for a decade or two, at least.

DURING the past ten years there has been a rapid increase in the number of industrial fairs annually held in Continental Europe, and the appeals for support is beginning to bother manufacturers. With a view to curbing the further multiplication of these events, delegates from the managements of all the principal international fairs held in Europe met at Paris last month with the International Chamber of Commerce to decide upon measures to be taken. Among the proposals made was one to the effect that the different interested Governments should give their support only to fairs of an international character. It was also suggested that dates be arranged by mutual consent so as to prevent interference and that applications should be made for reductions in transport charges for the exhibits as well as for visitors.

Supervision Costs Lowered by Increasing Individual Responsibility

Putting the right man in the right place is chief industrial problem, says Studebaker executive, talking on the problems of material handling. Careful study cuts down the records needed.

MANUFACTURING and inspection costs can be cut materially by increasing the responsibility of individuals in the organization and by training them so that they can perform their special tasks with a minimum of supervision. This thought runs through various parts of the discussion of "Material Handling Problems Encountered in the Assembly of Automobiles" given by M. R. Denison, superintendent stores division, Studebaker Corp., before a recent meeting of the American Society of Mechanical Engineers.

"It is a difficult problem," Mr. Denison said, "to get the storekeepers and storeroom men to realize that they are a service department and that the service they give must be the first consideration. The foreman must believe in the storekeeper and feel that the storesmen are handling the material as he wishes. This confidence is the first requisite of a successful material handling division."

He emphasized the importance of individual responsibility again when he said, in talking about counting and inspecting the material received, that "if we really are attempting to save money in costs, we will not recount material as it is delivered from the receiving department to stores, except in a small percentage of cases. The actual correct receipt of material, therefore, is exceedingly important. The real solution for any problem is to have the right man at the right place, but particularly is true in receiving departments."

Unreported Scrap

Again the same idea recurred when in Mr. Denison's discussion of unreported scrap, he said, "The matter of unreported scrap constitutes a problem which seems to be one of the most serious that has developed . . . The only inexpensive solution is to gain the confidence of the foremen and floor inspectors as well as that of the operators—have them understand the importance from a record standpoint and educate them to be fair to the management."

Carrying forward this thought and citing specific cases in which considerable saving has been made by decreasing the number of records necessary, Mr. Denison said in part:

After some study it has been found possible to discontinue certain records which at first were considered indispensable, for example, stores-quantity cards. Banks of material have been laid out carefully in every department as well as in every store room, and in this way the total to be carried in the plant is learned. The stores division schedules material on the follow-up and purchasing department on a basis of car requirements plus the total bank on the part plus any sundries such as scrap or service-plant needs.

This scheduling is made from a material-control record maintained in the production office, which record shows receipts, usage in cars (entered weekly), also any sundries and the balance available. This balance available is computed on every part or item weekly into the day's supply and carried forward to a graphic tape board. On these boards every part is separated into groups by the class of bank. That is, every part that goes into a motor on which a two weeks' supply is carried is side by side, and if the material situation is satisfactory every tape on these parts will be pulled down to an 11-day point, which represents a two-weeks' period.

Eliminate Stores-Quantity Cards

In view of this clear record, which indicated the amount available in the plant, the question arose, "Why have stores-quantity cards?" and the answer was their elimination. When before the store-room cards gave a check on receipts, a register now is maintained on all receiving reports to make sure they are going across the records. A cross-check also has been installed by sending the office copy of the receiving report to the store room receiving the goods, the store room returning their copy to the office as an acknowledgment of correct receipt. Storekeepers then file the office copy by part number in the store room.

No doubt the question will now be raised as to how the store rooms report shortages of material when they have no records.

A six-days' supply of each purchased finished part is carried in a separate location from the regular stock, and when through lack of material the storekeeper is forced to remove any material from this emergency location, he advises the production office. The part is then checked against day's supply on the control ledgers to make sure they are in accord, and reported to the follow-up men. In practically all cases it is found that the records have evidenced the shortage before and that the stock is near at hand.

This routine has a considerable bearing on material handling for the reason that if layouts are properly made, stock will not be received ahead of schedule without additional work. The graphic tape boards mentioned above are designed as much to indicate when material is getting in too soon as to prevent shortage of material, with the consequent delay.

On manufactured parts the bank of finished stock is so small that any foreman who is behind schedule knows that he is holding back production to some extent somewhere along the line.

One of the difficulties to be overcome in the automobile plant is the carelessness of store room men in handling expensive items which are easily damaged. This, of course, is due very largely to lack of instruction at the time the men begin work. For the good of all industry this should be hammered home particularly to storekeepers: "Properly instruct new men."

It is to be expected that if the men in store rooms are careless, then operators or assemblers who later get the parts will handle them in the same manner; and the problem then is to find who really is at fault, for one

is very easily able to say the other is to blame.

A carefully prepared set of instructions for men to read prior to starting to work in store rooms is to be recommended, as this method of acquainting men with their work will do away with the possibility of a storekeeper's overlooking an important part of a job, which he may easily do in instructing a man orally.

One very amazing development in the automobile plant is how, in spite of the variety of parts handled and operations performed, so many seemingly small things have received such individual attention. Out of this there have come innumerable arrangements for handling material that are very practical and helpful.

Conveyor Speed

So it is one finds in quite a few places a conveyor possibly traveling with its return twice as far as it needs to in order to deliver the material it carries, but by this extra travel it allows the store room employee to go to some other work for 30 min. after the conveyor is filled.

A great number of parts can be found on which special arrangements have been made with outside suppliers in regard to methods of packing and loading, each item having been thought out individually. For example, motor valves are shipped to the Studebaker plant in racks, each rack holding 120 valves. Six racks are placed in a box by the outside vendor. Upon receipt the racks are removed from the boxes and are sent to the motor stock room. The valves are then kept in the same rack in which they were received until assembled into the motor. After a rack is emptied its ends, being hinged, are folded back, and as many empties as possible are tied together and shipped back to the vendor. By this method counting and handling is kept at a minimum, and even though freight must be paid on the return of the racks, a saving is effected.

In some departments the work of inspection, counting and billing material out is combined and a man saved on the assignment.

At the point where rear axles are placed on the final line conveyor, there has been built an automatic pickup that lifts the axle at the proper time and locates it on the conveyor chain. In another location pistons are machined in one long, single line of machines and all operations are fast. Midway down this line an aisle must be traversed, which is rather busy with traffic, and this has caused the building of a semi-circular conveyor that arches up over the aisle and carries the line of pistons on to the next operator, over the heads of those who may be using the aisle.

Trying Out Automatic Counters

Automatic counters at inspection benches now are being experimented with. A chute has been installed leading from the bench down into a box or truck, with the automatic counter operated by a shutter or series of shutters as the pieces go down the chute. This eliminates one handling and also has possibilities of giving better counts than when pieces are counted by hand.

A circular gravity roller conveyor operating from the third to the first floor not only serves as a conveyance for finished seat cushions but also is sufficient in length to handle the storage of all cushions carried in bank.

Another example is in the machine shop, where a considerable number of parts that are later enameled are machined at many different points. These are all conveyed from the point where they are inspected after machining to the enamel department, which is located in one corner of the machine shop, by one overhead chain conveyor 700 ft. long, which passes through each section of the shop as well as the entire length of the inspection bay, and which is equipped with hooks so that the part can either be hung on the chain or placed in a suspended basket.

With each car is shipped what is called a tool box assembly, in which are placed the usual kit of tools—tire pump, jack, instruction book, grease gun, etc. Some time ago shortages began to occur in these boxes upon their receipt by dealers. At the suggestion of one of the assemblers a semi-circular table was provided with spaces for each item, and now the assembler first places in each compartment a given number of the proper part, and then when assembly is finished, if any stock is left in any section of the table, boxes are reinspected for shortage before being sealed.

Every car part used by the automobile plant should have banks carefully laid out in every department or store room through which it passes. Here is the real method by which material can be handled with the greatest economy.

The banks should be laid out with the idea in mind of carrying the lowest possible inventory, and space assignments should be such that trouble will develop if too much material is on hand at any stage of the operations.

After these banks are established, with the approval of the men overseeing the departments through which the parts pass, deliveries should be made rigidly to schedule and, in so far as possible, on a daily basis. Many advantages accrue from this plan, not the least of which is the fact that due to narrow banks foremen themselves must know exactly at all times where they stand. This does away with "stock chasing" and a great deal of unnecessary follow-up work and second handlings.

Records Posted During the Night

The Studebaker plant has found the narrowness of its finished banks such that all records on schedule boards must be posted during the night, so that all foremen and superintendents know exactly where every part stands on their arrival in the morning.

In addition to this, in certain departments deliveries made during the day are kept posted right up to the minute on a separate board for the foreman so that he may see if the daily delivery is being made.

The point has been reached in the machine shops where 80 per cent of the parts made are being put through machining operations and delivered on a daily basis. In assembly departments daily scheduled delivery is lived up to absolutely on every assembly. If this schedule for the month is 7500 and there are 25 working days, stock is delivered to the floor and finished assemblies delivered off the floor at the rate of 300 per day, or if the part is peculiar and the schedule for the month is 25, one is delivered per day.

Parts are more and more being considered on an individual basis, and therefore, on a certain malleable iron casting it may be necessary because of the assembly in which it enters going through painting operations or some other long course, to carry a two months' supply. On another malleable iron casting which is quickly machined and goes at once into a final car operation, the plant can and does get along with less than one week's supply.

With this daily flow of material it is essential that stock be available at all times for the departments, and it will become necessary in extreme cases to deliver ahead on one part, if out of another, so that foremen can conserve men-hours.

The real way to gain the good will of a foreman is never to ask him to rush deliveries on any item on which he is up to schedule according to the records. The thing to do is to change his schedule.

The correct assignment of banks and insistence of daily movement of parts will solve many difficult problems.

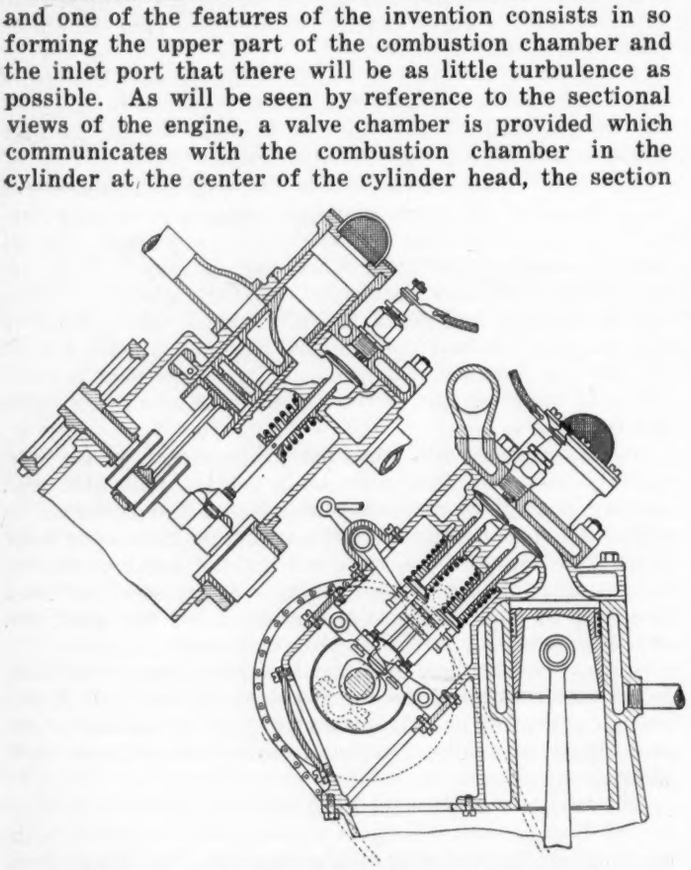
Economy of Fuel Attained by Means of Constant Compression Engine

Gas mixture and air are drawn in successively so that they will remain on different levels of the combustion chamber, and so that stratification replaces turbulence of charge.

EVERETT R. BURTNETT of the Automotive Valves Co., Los Angeles, Cal., has been engaged for some years in attempts to improve the fuel economy of automotive engines by the employment of the principles of charge stratification and constant compression. Several different experimental engines have been built and some of them are now being tested out. A good idea of the lines on which Mr. Burtnett has been working may be obtained from a patent recently issued to him.

In the engine covered by this patent it is aimed to draw in a substantially full charge into the working cylinder at all times, whether the engine is running under light or heavy load. This charge is made up entirely of combustible mixture when the engine is running under full load, but chiefly of an inert gas when the engine is only lightly loaded. In order to make it possible to fire a charge containing a relatively small proportion of fuel, provisions are made for stratifying the charge in the combustion chamber in such a manner that there is always a mixture of ignitable proportions in the vicinity of the sparking points.

Stratification is in a sense the antithesis of turbulence, and one of the features of the invention consists in so forming the upper part of the combustion chamber and the inlet port that there will be as little turbulence as possible. As will be seen by reference to the sectional views of the engine, a valve chamber is provided which communicates with the combustion chamber in the cylinder at the center of the cylinder head, the section of the communicating passage increasing gradually.



Burtnett four-cycle engine. Sections through cylinder and poppet valves and through inlet valve and control valve

Within the valve chamber or pocket there are two valves, the exhaust valve being located closest to the cylinder and the inlet valve farthest away from it. Adjacent to the inlet valve is located a piston-type of valve which is operated by means of a crank formed on the same shaft which carries the cams for the inlet and exhaust valves. When the piston valve is near the lower end of its stroke, as shown in the drawing, it places the inlet port in communication with the atmosphere, whereas when the valve is near the lower end of its stroke it places the inlet port in communication with the carbureter.

Design of Control Valve

The piston valve is so designed that communication of the inlet port with the atmosphere ceases at the same instant communication with the carbureter is established, but the point in the cycle at which this changeover occurs depends upon the relative position of a ported sleeve which surrounds the piston valve and which can be moved axially by the operator. The lower the sleeve in the valve chamber the earlier in the inlet stroke the carbureter will be placed in communication with the inlet valve port and the greater the amount of fuel drawn in during the stroke. On the other hand, if the sleeve is moved to a relatively high position in its cylinder the inlet port remains in direct communication with the atmosphere during the greater part of the inlet stroke and a considerable charge of air is admitted to the working cylinder before fuel from the carbureter is admitted. Owing to the smooth form of the inlet tract there is a tendency for the air, which enters the working cylinder first, to remain at the bottom of the combustion chamber and not to intermingle with the combustible charge admitted during the latter part of the stroke to any extent. This is the object aimed at.

Instead of drawing pure air into the combustion chamber during the first part of the inlet stroke, cooled and filtered products of combustion may be drawn in.

During the past winter Mr. Burtnett built two water-cooled two cycle engines embodying the charge stratification, constant compression principle. These engines are of four-cylinder construction and have a bore of 2⅜ in. and a stroke of 4 in. They were built into Ford touring cars, and Mr. Burtnett states that he drove 56 miles on one and a half gallons of gasoline, notwithstanding the fact that a 5 to 1 gear was used. The engines operate under 90 lb. compression.

AS a result of constant increase in the imports of automobiles, the Swedish Minister of Commerce has proposed an increase in the duty from 15 to 30 per cent. It is very likely that an increase in the tariff duty on automobiles and in the tax on gasoline will be discussed in the Chamber in the near future.

Warner & Swasey Prove That a Budget System Will Work and *Pay*

If an industry which is several removes from the ultimate consumer and subject to violent fluctuations finds it profitable, it will apply to other businesses.

By W. L. Carver

MANY of the unforeseen contingencies which arise in an industrial establishment can be avoided by the application of the budget system to every phase of the company's effort. Manufacturing, selling and advertising, engineering and the executive conduct of the business generally, all can be placed upon a budget system, with the result that all will be coordinated to a far better extent and in many instances apparent potential lean or unprofitable years will be converted into profitable periods.

These observations, which are founded upon several years' operation of the budget system in the machine tool field, were made by P. E. Bliss, vice-president of the Warner & Swasey Co. at the recent convention of the National Machine Tool Builders' Association. When it is remembered that the so-called seasonal variation of the automotive business is not a circumstance when compared with the sales curve of the average machine tool plant, the possibilities of the budget or any other plan which makes good in the latter field should find application among automotive manufacturers.

While the car manufacturer delivers his manufactured product directly to the ultimate customer and is influenced directly and immediately by economic and social flurries, the machine tool builder is not in immediate contact with the popular market for manufactured articles. The peaks and flurries of the car manufacturer are intensified into real "ups and downs" by the time their influence is felt by the machine tool builder. In the market for automotive production equipment particularly the demand for new machinery lags behind the car consumption curve, and at the first suggestion of a falling off of car demand is shut off almost completely.

Works to the Disadvantage of Both Sides

As a whole, car manufacturers do not set aside contingent funds out of profits which will allow them to utilize slack periods for the reconditioning and replacement of shop equipment. Consequently, machinery and equipment purchases are either way up or way down and the business between the two industries is transacted to the least advantage of either party.

The car manufacturer is required to make readjustments of the production line while under the pressure of high production demands and, by the same token, is faced by the necessity of disbanding his maintenance organization when business falls off. This condition is just another good reason for some sort of a budget system which would make funds available for plant improvement at the most opportune time.

In the system outlined by Mr. Bliss the most outstanding feature is the application of the budget principle to sales with reference to quantity and income. Offhand, this portion of the program would appear to be a refined form of gambling, but the experience of Warner & Swasey demonstrates that this end of the industrial and commercial fabric can be placed on a budget with results that are in line with the anticipated figures. In fact, this portion of the system is the foundation of the whole.

If a specified program of sales and, therefore, of equivalent manufacture can be laid down, the balance of the scheme is reduced to comparatively simple mathematics in combination with a knowledge of internal plant conditions and finally "horse sense." The last factor is the determining element of the whole scheme, just as it is in any policy or enterprise.

Sales Estimate 94.6 Per Cent Right

In 1923 the income from sales was 94.6 per cent of the figure which was established during December of 1922. This company sells almost entirely through its own representation, having salesmen covering all of the important territories over the country. On Dec. 1 of each year the salesmen are required to have an analysis of the business for the following year in the hands of the home office. Rather than being founded upon generalities, this analysis must deal with specific names and quantities and be scheduled in ten-day periods for the entire year. Due to its detailed characteristics, this analysis or budget must be founded on an intimate, specific knowledge of conditions and anticipated changes within the territory instead of optimistic or enthusiastic abstractions.

This analysis, which is in terms of the salesman's localized problems, is then matched up with an analysis made by the sales department at the home office, which is in turn scrutinized and made a portion of the master budget. The executives of this company feel that the policy of requiring the individual salesman to prepare a written, detailed analysis of his anticipated business is of tremendous value, particularly when he knows that he is expected to deliver in accordance with the schedule involved. While no anticipated program of this kind can be absolute, due to the very nature of business, the aggregate result has completely vindicated the policy. Deficiencies for one month or territory are washed out by the surplus of the next month or the surplus sales of another territory and at the end of the year results in the aggregate are very close to the anticipated figure as evidenced by the percentage of 94.6 for last year.

Neither the sales budget or any other phase of the policy can be likened to a magical process or cure-all which will alleviate the ills of business in its first application. As Mr. Bliss stated the case, the success of the system is

built up largely upon the cumulative experience of years of intelligent guessing with respect to a particular problem. By approaching the problem from this angle, the terms of the guess or estimate are the terms of the problem and many of the trick phrases that have crept into sales analysis are prevented from confusing the issue. The salesman's estimate or budget in the concrete terms of his individual territory is balanced by the application of a very few fundamentals, which is the chief function of any home office, the whole thing being given the acid test of the horse sense which should grow out of long contact with any enterprise.

Psychology as a Factor

Psychology also contributes its part to the success of the scheme. In the first place, no intelligent salesman will present a program that is impossible of accomplishment. Furthermore, in laying out his program the salesman will naturally tend to schedule his work over the entire year insofar as local conditions or his analysis of them will permit. This process tends to level out the peaks and make for more consistent effort and, consequently, turnover throughout the entire year. Finally, after a scheduled program in which the salesman has had a determining influence is adopted, it becomes a bogey for each hole, just as in golf. In this game, however, instead of eighteen holes there are twelve months, each of which is divided into ten-day periods. Every man likes to prove the accuracy of his own opinions of predictions and, if necessary, is willing to put on some extra pressure to make results match with his figures.

In spite of adverse conditions during the first quarter of this year, the business of this company is following the course of the budget very closely. That this has occurred must be ascribed to the art of intelligent guessing and horse sense which are synonymous with the knowledge or "feel" of the real fundamentals affecting an enterprise. While the master budget may be slightly modified from time to time, particularly as regards disbursements from the home office, the salesmen's individual budgets are not changed from the original figures and reports are sent each man periodically. These reports show the comparison of the budget and actual results for each period and accumulate to draw the comparison for the year up to date.

Collections Estimated in the Same Way

As sales without commensurate financial returns do not keep a plant running very long, collections are also scheduled in the budget for the same ten-day periods, that is, three ten-day periods for each of the twelve months. Ordinarily, in the machinery business only the last ten days of the month are particularly remunerative, and the available funds of the company fluctuate accordingly. The plan of scheduling collections over the 36 periods of the year was adopted with the idea of leveling out the income curve so far as possible. This effect has been very apparent, and for 1923 the collection department fulfilled its schedule with an efficiency of 96 per cent.

With a volume figure of 94.6 per cent and a collection figure of 96 per cent of expectations coupled with a schedule, it is evident that many of the problems of manufacturing are greatly simplified.

Cost analyses involving total costs are only of value when related to the time element. A cost which is based on a production of ten units per day is much different than that obtaining when only two units per day are produced. The difference is brought about largely by the increase in overhead and carrying charges when prorated over the smaller production. How to meet this condition and have a little profit left over is the biggest problem that confronts a manufacturer who has but a vague idea of what the year's program may be.

On the other hand, if experience has demonstrated that a program which will approximate actual conditions by at least 90 per cent can be established, the manufacturer can then plan his production and maintenance program for the entire year. In the budget system which Warner & Swasey are using expenses are grouped under four heads: Manufacturing, conduct of business, sales and advertising, and engineering.

The expenses of all these groups are also scheduled in ten-day periods, as is the income from the collection department. Each division is required to submit a scheduled program and list of expenditures in the same way as the sales department treats anticipated sales.

These programs, in addition to the sales program, are carefully scrutinized and modified during the month of December by the executives and board of directors of the company and are finally welded into a composite budget for the year with definite programs of expenditure and activity for each division.

Advantages Shown

Several advantages which are reflected in each department arise from the coordinating effect of the system. One of the outstanding advantages is the ability to make plant changes or improvements at the most opportune moment. As the production schedule is definitely established, men can be diverted to repair work or plant changes during the lower portions of the production curve. This ability in turn levels out the employment curve and works to the advantage of both employer and employee. The advantages of a stable relationship between these two parties are well known to every member of any industry.

Each department head in the manufacturing division is required to submit a detailed budget of expenditures which is founded on similar efforts by the foremen. This procedure gets the idea of thrifty management right down to the man on the job and has produced some astonishing results. Shop foremen in their effort to set down detailed, scheduled budgets of expenditures have unearthed a whole new field of economies. In fact, the manufacturing cost of the product has decreased in the face of an ascending wage scale largely as the result of economies of detail arising out of the shop foremen's intimate knowledge of what constituted necessities and what bordered on the superfluous.

An engineering budget at first glance is somewhat of a sensation, but upon further analysis is entirely within reason. Most of the engineering around a plant already engaged in the manufacture of any product is largely a cut-and-dried proposition and should not be confused with the unbridled outbursts of genius which the popular story writers ascribe to engineers.

Allowing for New Developments

The enterprising manufacturer always has some new development work under way, but this work ordinarily does not require an inordinate expenditure and can be covered very well by an appropriation. The balance of the engineering is largely a service consideration which at its maximum should parallel the production schedule and therefore be gaged accordingly as to expense. In fact, a few manufacturers in the automotive field have found it possible to not only budget engineering expense but also to assign and maintain schedules for the completion of specified designs.

In the Warner & Swasey organization the engineering department submits a program of development and an expense budget, both of which are scheduled into the 36 ten-day periods. Where required, development or research

work are covered by appropriations which are in turn scheduled.

Sales and advertising expense are handled in much the same way as the manufacturing and engineering expenses, with variations in detail rather than principle to suit the requirements of the specific department. As applied to the executive department or the conduct of the business as a whole, the budget system opens up a most attractive field of possibilities. In this portion of the budget are included every item of taxes, insurance, corporation and other fixed expenses, each item being assigned to its required place in the annual schedule. By setting down all of these items in an orderly manner it was found that a rearrangement of dates where possible had a considerable effect in removing peak points and thus tended to keep the business on a better turnover basis. Sometimes the concentration of a few necessary items of this nature will make a serious inroad into the finances of an organization and will ultimately result in a capitalization larger than is actually needed under better management. As profits must be made for this excess capital, it follows that profits are lowered along the line; also the possibility of the establishment of a strong surplus account is reduced.

The Matter of Dividends

When shall dividends be paid and when does the surplus cash on hand warrant outside investment, or is there actually anything available for either? These are questions which always confront the manufacturer who has no clear picture of his business. According to the executives of the Warner & Swasey Co., the budget system as explained here provides a most adequate answer. They state that dividends have been paid regularly in accordance with the general situation and enough profits have been made out of the investment of temporary surpluses to leave a substantial profit over and above all of the expenses of the accounting department. Unless the clear picture of immediate and remote requirements as charged against scheduled receipts were available, these investments would have been impractical, as in many cases would have been the payment of dividends.

One feature is important in making outside investments. The relations of the manufacturer with his banker must be borne in mind; each must be in the full confidence of the other. In order to fulfill this condition, Warner & Swasey place their temporary surplus funds through their banking connections.

The Benefits of the System

In summing up the advantages of the budget system, it will be seen that it tends toward the coordination of all departments and the more perfect unification of the business as a whole. The expenses and activities of every department are placed in balance with relation to each other and the income from sales. As worked out in this case, there is a leveling out of the year's business, with receipts and disbursements taking a rational, rotating balance which must reduce the capital requirements for operations. The schedule features of the sales budget also tend to level out the output curve and therefore establish a smooth flow of production

A brief review of the items which are liable to be affected by the budget system will demonstrate that in the vast majority they are in the overhead class. The first effect of the system is the scheduling of production so that the overhead can be adjusted to the prime cost. Ultimately a system of this kind, when applied in all of its phases, should iron out the annual production curve, possibly not into a straight line but at least into grades that can be taken easily. This feature, combined with the opportunities for maneuvering capital, men, buildings and material within the organization, should recommend the budget policy to manufacturers in any field.

Many of the maneuvers of this nature which are now effected in the automotive industry are made as emergency or temporary expedients and have an inordinate effect on either the overhead expense or capital account. In a scheme of management like the budget system, expansion or changes can be made out of profits instead of capital. If there are not sufficient profits, then it is a question if the expansion or change is warranted.

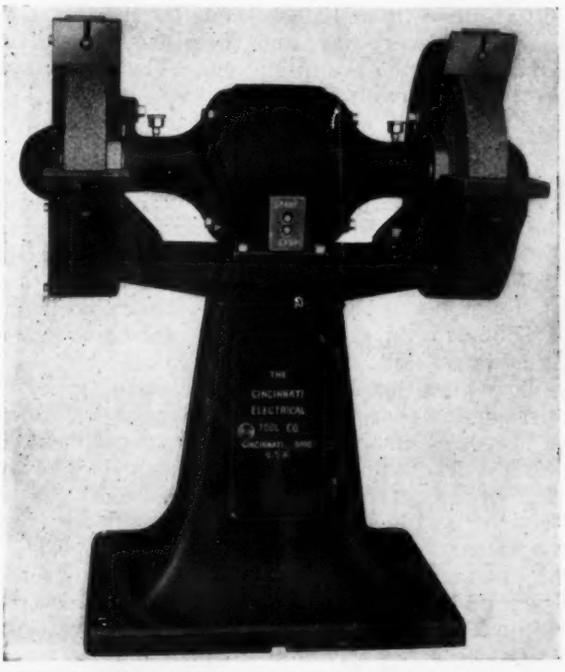
Overhead expense is about the nearest thing to perpetual motion that the machine tool or automotive manufacturer, the dry goods merchant or the automobile dealer is ever liable to witness. Even today, with the period of the rapidly expanding market past and the necessity for meeting the most stringent competition at hand, reduction of overhead or the cost of doing business is the biggest problem facing automotive enterprises.

From now on the expansion of any automotive enterprise is justified only when it can be done out of profits. In other words, expansion will follow profits instead of profits following expansion. The budget system alone will not correct the situation, but a similar scheme which makes a critical detailed analysis of the market from an operating period which is based on concrete facts and experience rather than unbounded enthusiasm.

New Heavy Duty Floor Grinder

THE Cincinnati Electrical Tool Co. has recently added to its line a 5-hp. floor grinder suitable for all kinds of heavy duty grinding in foundries, etc. It will carry wheels up to 18 in. diameter and 3 in. width of face. The wheel guards are of the exhaust type, in accordance with safety rules, and are adjustable for wear of the wheels. Removable covers bolted to the guards completely inclose the sides of the wheels, the flanges and nuts.

The motor is ball bearing and fully inclosed. The starting switch is of the magnetic type push-button control and is mounted on a separate panel within the column. This grinder may be had for two- and three-phase alternating current of 220 and 440 volts, 25 to 60 cycles.



Five-hp. floor grinder which will carry wheels up to 18 in. diameter and 3 in. width of face

Taxicabs Restricted from Cruising on Certain Streets in New York

Move which started with the elimination of vehicles plying Fifth Avenue in search of fares has been extended. Time for loading and unloading is the limit allowed for parking.

"IT is my job to keep traffic moving and I'm going to do it," Dominick Henry, Deputy Chief Inspector in charge of traffic regulation in all five boroughs of New York, stated.

"Supposing we should allow every person in the Woolworth Building or the Equitable Building at 120 Broadway to bring in his car and park it on the streets for a single day?" This is the gist of an interview on traffic congestion with a member of the AUTOMOTIVE INDUSTRIES staff.

After an experimental period in which taxicabs and horse drawn vehicles which plied Fifth Avenue cruising for fares were restricted to other streets, that plan has been extended. It is estimated that there were 5000 less vehicles on that street per day.

Beginning June 10 taxicabs which are not carrying a passenger or passengers will not be allowed to solicit fares on Fifth Avenue from Washington Square north to Sixty-fifth Street between the hours of eight in the morning to eight in the evening, nor on Broadway from Twenty-third Street to Fifty-ninth Street between the hours of eight in the morning to twelve o'clock midnight.

This scheme of restricting empty vehicles on main thoroughfares is one which will warrant the attention of every individual interested in the traffic situation. While it is still in an experimental stage, the elimination of several thousand cars per day from one street which is heavily congested offers a very considerable help, and it may mean a solution for the many other cities which have the same problem.

There are more than 10,000 people housed in the Woolworth Building every day, and there are more than five times that many who are in and out. There are as many or more for 120 Broadway.

Traffic Towers Prove Their Value

The traffic situation in New York has grown as fast if not faster than the problem of any other metropolitan area in the country. Various experiments have been tried; some of them have proved very successful; for instance, the traffic towers, which have been extended from the first temporary towers on Fifth Avenue to Park Avenue, to the Grand Concourse in the Bronx, and are being added as rapidly as is feasible.

The story goes that Dr. John A. Harriss, Deputy Police Commissioner in charge of traffic, built the first few temporary towers at his own expense as an experiment. Anyone who has driven up Fifth Avenue since they have been in operation and before traffic was so controlled knows how much simpler and how much more comfortable it is at the present time.

That did not relieve all of the congestion or even a small part of it, but it meant that one could move several blocks in one direction at a fair rate of speed rather than creeping along a few inches at a time from one street intersection to the next. The next thing that had to be done was to relieve the congestion or as much of it as was possible. The first step has been to remove the empty taxicabs from a few of the more congested streets.

With regard to parking, the new regulations read:

"No motor or horse drawn vehicles shall be parked along either curb of the following streets in the Borough of Manhattan, except while actually engaged in receiving or discharging passengers and merchandise, between the hours of eight o'clock in the morning and twelve o'clock at night:

Streets on Which Parking Is Restricted

"Broadway from Bowling Green on the south to Seventy-fourth Street on the north.

"Fifth Avenue from Waverly Place on the south to Sixty-fifth Street on the north.

"Lafayette Street from its interception with Center Street on the south to Fourth Avenue on the north.

"Fourth Avenue from Ninth Street on the south to Thirty-third Street on the north.

"Park Avenue from Thirty-third Street on the south to Fifty-sixth Street on the north.

"Varick Street from the junction of Franklin Street and West Broadway on the south to Carmine Street on the north.

"Seventh Avenue from Carmine Street on the south to Fifty-ninth Street on the north.

"All rules or parts of rules and special traffic regulations in conflict herewith in respect to the application to the streets thereof or parts thereof above designated are hereby rescinded but in all other respects they shall remain in full force and effect."

In addition, five streets at the approaches to the Williamsburg and Manhattan bridges will be prohibited to parking.

Asked if cross street congestion would not result from restricting the taxicabs from the up and down streets, Inspector Henry replied that "We will meet that when we come to it."

He said that he was in favor of an elevated road which would extend around the island of Manhattan from Dyckman Street at the north and west, down the bank of the Hudson to the Battery, up the East River, and on through the Bronx. He stated that it could be built at not an unreasonable expense and that it would not interfere with traffic to build it. The plan includes a speed of thirty miles an hour or better, with driveways leading to the street level every mile or so.

The question of where one could park his car should he drive into downtown New York from some other section of the city, or from outside, is another thing. That, too, is a real problem, but not one that Inspector Henry is called upon to answer.

He spoke of the buildings of ten and twenty stories which were replacing dwellings which had housed fifteen or twenty people. Neither sidewalks nor streets were designed to carry the pedestrians or the traffic they are

called upon to bear. As a consequence, the buildings will eventually have to house the sidewalks under some scheme such as that of the arcade.

For the loading and unloading of merchandise stores and shops will some time have to provide space within their walls, perhaps some such means as that of Macy's in New York. There all trucks are loaded in the basement several floors under ground or on the floor on which the particular class of merchandise belongs; the latter plan, which is in effect in their new addition, saves one handling of the goods.

Plans to relieve congestion of traffic are being tried out in cities all over this country and throughout the world. The great need is, in Inspector Henry's words, "To keep traffic moving."

Since the ruling has been made four of the largest organizations of taxi drivers in New York have joined forces to fight the non-cruising regulation and to protect themselves from other restrictions. The chauffeurs are said to have the backing of dealers in motor cars and supplies.

Under instructions from the Taxicab Board of Trade, a taxicab driver will violate Police Commissioner Enright's order against cruising within certain zones so that an attempt may be made to test the matter in the Appellate Division of the Supreme Court.

British Government to Resume Lighter-Than-Air Development

REPLYING to a recent inquiry in Parliament, Prime Minister MacDonald stated that the Government had decided to reject the scheme put forward by the Airship Guarantee Co., commonly known as the Burney scheme. This scheme would have entailed the creation of a virtual monopoly and contained a number of other features that were open to objection on both financial and technical grounds. The Government, he said, at the same time considered it to be essential to carry into effect as early as possible a constructive program of airship development.

It is proposed to authorize the Air Ministry to initiate forthwith a comprehensive program of lighter-than-air research and experiment at Cardington, including full scale experiments with one of the existing ships, which will be reconditioned for the purpose, and to undertake the early construction of a new airship of 5,000,000 cu. ft. capacity.

The Air Minister also will undertake the construction of a terminal and of an intermediate base overseas, with the necessary facilities to enable these two ships to be operated safely between England and India.

Simultaneously the Air Minister will give the Airship Guarantee Co. the first offer of a contract for the construction of a second ship for commercial purposes. This contract is to include a clause which will permit the constructors to repurchase the ship from the Air Ministry at a reduced figure on completion of satisfactory flying trials, provided—

1. That it is to be operated in connection with an approved British commercial airship service; and
2. That it shall be available for use by the State as required.

By these means it is hoped to link private initiative with lighter-than-air development from the start, and in the event of success the inauguration of commercial airship services open to all firms will be facilitated. This second vessel also will provide the nucleus of a reserve of personnel and material, of great value from a military viewpoint.

Advantages of This Proposal

The Prime Minister said this proposal should permit of two airships being placed in commission in a shorter period than under the original (Burney) scheme, since the Government and commercial vessels would be laid down simultaneously. Another consideration is that they will result in the maintenance of two separate airship factories and other ground facilities on a scale which will permit of rapid expansion. Besides, the existing airship stations at Cardington and Pulham will remain Government property instead of passing into private hands.

As regards the financial aspects, the Prime Minister said it would not be necessary to incur from the outset the very heavy commitment (nearly £5,000,000 distributed over a period of 15 years) involved in the Burney scheme. A three years' program will be authorized at the start and before it becomes necessary to make decisions as to further developments much additional information will be available.

Nozzles vs. Orifices for Air Flow Measurement

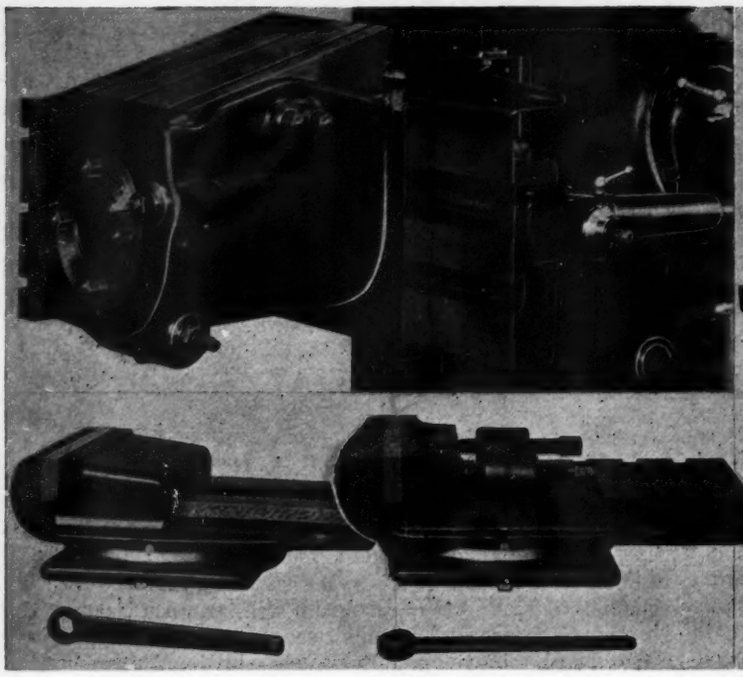
THERE seems to be some difference of opinion among test engineers as to the relative advantages of nozzles and square-edged orifices for the measurement of air flow by the pressure drop method. Writing in *Engineering* of May 2, John L. Hodgson strongly takes the part of orifices. He says:

"It is impossible to make nozzles which have constant coefficients of discharge over the range of flow usually worked with, viz., for values of QW/d_1u between, say 50 and 1500. The coefficient of discharge of nozzles varies from about 0.93 at low working flows to 0.99 at high flows.

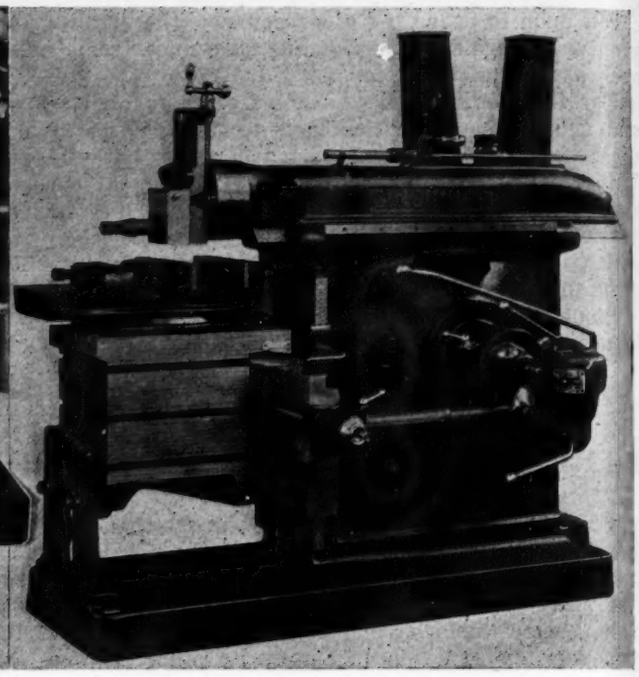
"Nozzles whose contours have abrupt changes in the radius of curvature, either due to the method of setting out or to faults of machining, have usually lower and less regular coefficients of discharge than those with smooth contours. Even when great care is taken with the machining, it is found extremely difficult to produce nozzles whose coefficients of discharge agree to within 2 or 3 per cent. The writer has found that at the flows usually worked with the coefficient of discharge, even for well-formed nozzles, is nearer to 0.96 than 0.99.

"Square edged orifices, on the other hand, are perfectly easy to reproduce with such accuracy that their coefficients of discharge can be relied upon to within one-quarter of 1 per cent. They are also much cheaper to make than is the parabolic nozzle."

ACCORDING to experiments made in England by Prof. A. H. Gibson and reported on in a paper read before the Institution of Mechanical Engineers, the exhaust valves on automotive engines reach their highest temperature at full throttle, with the weakest mixture capable of maintaining maximum load, with the highest jacket water temperatures and with a retarded ignition. All these conditions assist in lowering the temperature of combustion, tending to keep the heat in the charge until the opening of the exhaust valve, with the result that the gases flowing past the valve are hotter.



Illustratiny the swiveling table feature



New Cincinnati shaper for the tool room

New Line of Shapers Designed Especially for the Tool Room

The latest product of the Cincinnati Shaper Co. has the same mechanical features as their "Climax," including an eight-speed, internal transmission and visible, automatic oiling.

THE Cincinnati tool room shaper, a new product of the Cincinnati Shaper Co., is built up of the main elements of the same firm's Climax shaper, described in our issue of Dec. 13, 1923, and is therefore furnished in the same sizes, viz., 16, 20, 24, 28 and 32-in. stroke standard and 20 and 24-in. stroke heavy. It follows that this machine has the same mechanical features as the Climax, including an eight-speed internal transmission, completely automatic and visible oiling, a smooth, cam-actuated feed in place of the abrupt ratchet feed, direct reading indicators for feed, speed and length of stroke, convenient controls for all movements, and improved guards on the ram ways and cross rail.

The Cincinnati tool room shaper is furnished in either single pulley or motor-drive form. A general description of the single pulley drive and internal transmission was given in our Dec. 13 issue. The motor drive is a departure from usual practice. As the internal transmission provides for eight speed changes within the column, a constant speed motor is used in all cases. This is mounted at the rear of the machine and is bolted to the base and column. It is belt-connected to the main driving pulley on the shaper, the pulley being designed for a motor speed of 1800 r.p.m.

A ball bearing counterweighted idler pulley on the slack side takes up any stretch in the belt automatically. An advantage of the belt connection is that it acts as a buffer between the motor and the tool in case of shock. The belt is completely guarded. The whole arrangement is so designed that the machine can be readily changed from single pulley to motor drive at any time.

The striking feature of this shaper is its universal swiveling table, which swivels about a heavy trunnion extending the full length of the table and cast solid with the apron. A worm and worm wheel, operated by a crank wrench, revolve the table to any angle or position desired, the angular position being indicated on the graduated plate on the front end of the trunnion.

The table has one solid face, similar to that of the standard shaper table, while the second face is a rocking top set well into the body of the table and has a movement of 15 deg. both above and below the horizontal on an axis at right angles to the trunnion. This movement is controlled also by a crank through a worm and worm wheel, the position being indicated by graduations.

Clamping means are provided for holding this tilting top in any position and at the same time insuring a solid bearing for it in the body of the table. Adjustment of this rocking surface to various positions does not change the mean distance between the table and the tool post, so that no loss of working distance under the tool occurs in any position.

The table is furnished without an outer support, but is made unusually rigid, the apron bearing on the rail, for instance, being 6 in. wider than that of the standard box tables on the Cincinnati Climax shapers. Tests have shown that it will not bind on any of its sliding surfaces under a load of 2000 lb.

Either single or double screw vises are furnished with this shaper. The double screw vise, of course, has the advantage of clamping taper pieces without the use of extra jaws or shims, while the single screw offers the advantage of a little faster operation. Only one wrench is required for the vise, tool post screw and various other clamping nuts for adjusting the shaper to its work.

The design of the swiveling base, in which only four bolts are used for swiveling and securing to the table, is such as to permit a material reduction in the height of the vise.

This machine is provided with an automatic power feed to the head, with a ball bearing lever for engaging or disengaging this movement. Means are provided for automatically stopping the down-feed at any desired depth, the setting being effected either with gage blocks or by trial, as in the case of slotting.

Various attachments, such as index centers, circular feeding table and cone arbor, are furnished. Specially high speeds are furnished, up to 138 strokes per minute, for fast work in short strokes. There is also a convenient range of feeds, from 0.010 to 0.170 in.

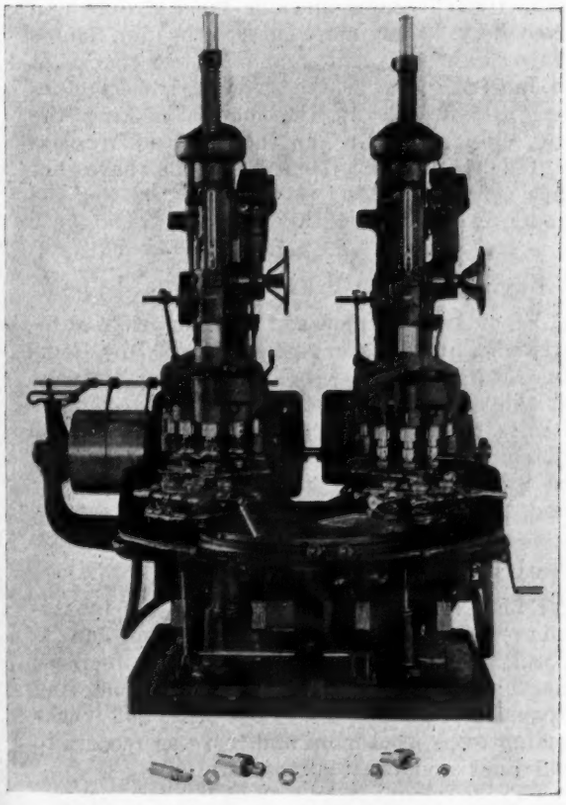
Automatic Drill Has Self-Indexing Work Table

AN automatic drill and an automatic tapper with self-indexing work table have been developed by the Barnes Drill Co. of Rockford, Ill. The machines are built either as drill presses, as tappers or as combined drilling and tapping machines. They are also made in three sizes, of 20, 22 and 24 in. swing, the 22 in. being designated as a heavy duty type.

These "automatics" embody the essential elements of the Barnes Drill Co. all-geared self-oiling drills, but in addition have the automatic spindle control and either a hand-indexing or self-indexing work table.

Illustrated here is the two-spindle No. 222 automatic gang machine equipped for fast production on heavier work, such as three parts of malleable iron unions. Each main spindle is fitted with a four-spindle auxiliary head, and there is a four-station hand-indexing rotating work table serving both heads.

In all two-operation work, such as the union nuts, four pieces are bored under the first head and four other pieces are simultaneously tapped under the second head, while the operator reloads one of the spare stations. Thus the loading time and tapping time are free.

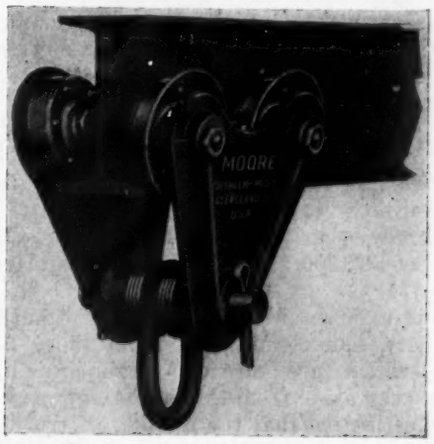


Barnes Drill Co. two-spindle automatic gang drill and tapper

The work table is then indexed one-quarter way around and operations are repeated. It is claimed that less than two seconds is required to index. The fixture rotates on ball bearings, and the moment the fixture locates under the spindles the tools automatically approach and enter the work. When the predetermined depth of feed has been reached the spindles automatically return to the upper position, where they remain till the operator indexes the fixture, whereupon another cycle begins.

In single operation work, such as pipe ends of unions, eight pieces are tapped simultaneously with the reloading of the two spare stations, and the work table is then indexed 180 deg. Facing operations may also be accomplished automatically by means of a special "dwell" mechanism that can be fitted to the machine.

New I-Beam Trolley



Moore ball-bearing I-beam trolley with bearings built into the wheels

A NEW ball-bearing, oscillating type of I-beam trolley known as the Moore has been announced by the Chisholm-Moore Mfg. Co. of Cleveland. One feature of this trolley is that the wheels have the bearings built in, which makes the whole a single unit and reduces the cost of construction.

The Moore trolley weighs 17½ lb. It is claimed to be unusually simple in construction, comprising only eight parts, not counting washers, cotter pins and nuts. It is built in only one size which is designed to handle up to one ton. The trolley is directly adapted to I-beams of from 4 to 7 in., and by means of special separators, which are furnished as an extra, it is adaptable for use on larger beams. It can be used with any make of chain block and hoist.

Here and There in Foreign Markets

By special arrangement with the Automotive Division, Bureau of Foreign and Domestic Commerce

Hungary Needs 15,000 Tires Each Year

WITH some 2500 passenger automobiles registered in Hungary in addition to about 500 official cars, the annual consumption of tires is about 15,000. The mileage obtained from Hungarian tires, both the fabric and cord, is only from one-third to one-half of that obtained from foreign tires.

A total of 108.3 metric tons of tires, concludes the dispatch, was imported in 1923 as compared with 165.6 tons in 1922; the decrease was chiefly the result of the decline in imports from Austria and Germany. This decline was entirely made up by domestic production. Official statistics show imports of 233 automobiles during 1923, but since these were equipped with foreign tires upon entry, additional requirements from this source will not be felt until the middle of 1924. America's participation in this tire business has been very small. This situation is especially deplorable since sufficient numbers of straight side tires to equip American motor cars which are in operation in the country cannot be imported from America. Straight side tires are not made in Hungary.

Competition Keen in Switzerland

SWITZERLAND is an excellent potential market for American cars, but competition is keen, particularly from foreign makers who benefit by greatly lower shipping charges. The manufacturer who gives close attention to his export sales will win a place in the Swiss market as several American firms have already done.

The present size of the Swiss market for American automotive products is indicated by 923 export statistics, which show that shipments from the United States to that country last year included 495 passenger cars, 321 motorcycles, unit assemblies valued at $37,600 and parts and accessories valued at $33,415.

About a dozen American cars now have agents in Geneva and competition from these American makes which are already established and well known, even aside from that of foreign cars, is keen.

It is estimated that the number of trucks now in operation in Switzerland, is 6,000. At an automobile exhibit in Geneva during March, 74 makes of cars and 40 makes of motorcycles were shown.

Sweden Adds Gasoline Consumption Tax

EFFECTIVE June 1, all gasoline imported into Sweden must pay a duty of 0.01 crown per liter. A consumption tax of 0.05 crown per liter has also been assessed against the automobile users of that country, as a means of raising moneys for road improvements. In passing the measure on May 14 the Swedish Riksdag members expressed a belief that the tax would benefit the good roads movement "by encouraging wider and more general use of automobiles and trucks," according to a cable sent the U. S. Department of Commerce by the American Minister at Stockholm.

Czechoslovakia Exempts Certain Taxes

BY a decree effective April 8, motor vehicles having a total cylinder content of 2½ liters or less are exempted from the payment of the luxury tax of 12 per cent imported into Czechoslovakia, although they are still subject to the turnover tax of 2 per cent. After December 31, 1924, the figure relative to cylinder content for exemption from the luxury tax will be reduced to 1.8 liters.

The exemption does not include vehicles obviously of a de luxe character, such as racing cars, etc.; motorcycles of more than 2 cylinders with more than one liter total cylinder content; nor auto accessory equipment of extraordinary character such as heating devices, unusual electrical equipment, speedometers registering over 100 kilometers an hour, and speaking apparatus, when imported separately.

In order that officials may be able to determine whether or not the vehicle is subject to the luxury tax, the importer must furnish an official certificate, indicating the number of cylinders, bore and stroke.

Cars Entering Brazil Through Santos

OUT of thirty-five automobiles imported at Rio de Janeiro in March thirty-three of them came from the United States and one from France and one from Italy. Many more entered through Santos to escape the 2 per cent gold port tax charge at Rio de Janeiro. Most of the American distributors reduced prices early in the month, making the present selling price in the thousand dollar class about 13,500 milreis. Terms of sale have not changed, most cars selling for one-half cash and the remainder in twelve monthly payments.

China Buying Medium Priced Cars

SALES of American low and medium priced automobiles in China are reported good by Commercial Attaché Julean Arnold at Pekin. He says this is due to seasonal activity. He also reports small sales of European cars. March imports of automobiles totaled 128, with the share of the United States amounting to about 66.4 per cent; England, 21.8 per cent and France, 7.8 per cent.

Sweden Uses Many Buses

NINETEEN motor buses to every 1000 inhabitants were in operation in Sweden on Jan. 1, 1924, and motor bus traffic is expected to increase considerably within the next few years, following the expansion of good roads. Both buses and trucks are coming to be used more and more as feeders to railroad lines and coast steamers.

Vacuum Tubes Applied to Engine Ignition

Automotive application of thermonic valve covered by patents pending for Robert Bosch. Makes it possible to place ignition system anywhere on car and eliminate mechanical interrupter.

OF late years the three electrode vacuum tube, also called a thermonic valve, has come to play a very important part in various applications of electrical energy, its most extensive use at the present time being in radio broadcasting and receiving sets. Such a tube consists generally of a highly evacuated glass tube containing an anode or a positive element in the form of a metal plate, a cathode or negative element in the form of a thin filament of tungsten or other wire, and a grid interposed between the anode and cathode (or between the plate and filament). If the filament is heated to incandescance, by connecting a battery of suitable voltage across its terminals, current can be sent through the tube from the plate to the filament, if these two parts are connected to a current source of the proper voltage.

By interposing the grid between the plate and the filament the flow of current can be controlled even though a steady voltage be applied to the tube. This is accomplished by changing the electrical potential of the grid relative to the potential of the filament. If the potential of the grid is lower than that of the filament by a certain amount, no current can flow through the tube, whereas if the potential of the grid is higher the current will flow through the tube freely.

Current will flow through the tube in one direction only. When one of the electrodes is heated it will give off electrons or ions carrying negative charges. Hence, a negative charge will be carried from the filament to the plate, which involves the transfer of a positive charge through the tube in the opposite direction, and as the current is supposed to be represented by the motion of a positive charge, the current flows through the tube from plate to filament.

The Oscillating Circuit

Vacuum tubes are generally used in conjunction with oscillating circuits. An oscillating circuit is one having relatively high capacitance and inductance and a low resistance. If an electromotive impulse is impressed upon such a circuit a current will surge back and forth in it for a certain period depending upon the resistance in the circuit, because it is the resistance which causes the dissipation in heat of the energy which is stored in the condenser and in the inductance coil when the electromotive impulse is applied. Such an oscillating circuit is very much like any mechanical vibrating system, such as a pendulum or watch spring, which when once given an impluse will keep on vibrating until its energy is dissipated in friction.

In order to keep a watch spring vibrating indefinitely, the energy necessary to overcome friction must be constantly supplied from the outside, and this is done by means of the main spring and the escapement. In a similar way electrical oscillations can be maintained constantly in an oscillating circuit by supply to that circuit from an outside source sufficient electrical energy to make up for that necessary to overcome the resistance of the oscillating circuit.

When a steel spring is vibrating there are three properties of matter in play. When at rest the spring occupies what is referred to as its position of equilibrium, and when in vibration it moves first to one and then to the other side of this position. The thing that keeps it going beyond its position of equilibrium is its inertia. Parts of the spring and any weight supported by it when passing through this point are in rapid motion and hence a certain amount of energy stored up.

As the spring approaches one extreme of its swing the kinetic energy is converted into molecular stress, and when the end of the swing is reached all of the kinetic energy is gone and whatever energy is left is in the form of molecular stress. The property of matter which permits energy to be stored in it by deforming it is its elasticity.

The third property of matter that comes into play is friction. Partly owing to molecular friction within the spring and partly because of air friction, the vibrations will become smaller and smaller and finally ceases altogether.

Electrical Energy Similar to Mechanical

Electrical energy is a counterpart of mechanical energy in every respect, and when electrical oscillations occur in a circuit there are three electrical properties at play which correspond exactly to the three properties of matter above mentioned. The inertia of matter, by reason of which it is capable of storing kinetic energy, is analogous to inductance in electric circuits. The inductance of an electric circuit is that property by reason of which a magnetic field is set up in the vicinity of the conductors comprising the circuit when a current is established in it. The elasticity of matter, by reason of which it can be put under molecular stress, corresponds to capacitance of electric circuits. Capacitance of electric conductors is that property by reason of which charges of electricity can be bound on their surfaces.

The same as all kinds of matter have inertia, elasticity and frictional properties, so every electrical circuit has inductance, capacitance and resistance. The inertia of a body is directly proportional to its mass, and inertia effects therefore are most pronounced in connection with materials of great density, such as steel, lead, mercury, etc. Similarly, while all electric conductors possess inductance to some extent, induction effects are most pronounced if the conductor is in the form of a coil, and especially if this coil has a soft iron core. The elasticity of a body is measured by its modulus of elasticity, which (so far as the more common materials are concerned) is highest for steel. Of course, the amount of energy which can be stored elastically in a unit of a given material depends not only upon its modulus of elasticity but also upon its proportional elongation when stressed to the elastic limit and the corresponding reduction of area. From this point of view india rubber is considerably ahead of steel.

The corresponding electrical property, capacitance, depends upon the surface area of a conductor, the nearness of adjacent conductors insulated from it and the nature of the insulating material filling the intervening space. In order to obtain the greatest capacitance with a certain amount of conducing material or within a given space we

have to form the conducting material into two sets of plates, all plates of each set being electrically connected together, each plate of one set being located between two plates of the other set, the plates of opposing sets being very close together but separated by a layer of some insulating material. Such a construction is known as a condenser. The same as energy may be stored in a steel spring by putting that spring under load, so energy may be stored in a condenser by subjecting its terminals to a difference of potential.

Potential and Kinetic Energy

Looked at from the standpoint of energetics, the vibration of a spring consists in the alternate conversion of a store of energy from the kinetic to the potential (or molecular stress) state and from the potential back to the kinetic state. All that is necessary to start the vibration is to give the spring-supported mass an impulse, and vibration then continues until the energy of the impulse has been completely absorbed by friction.

Similarly, electric oscillations consist in the alternate conversion of a store of energy from the potential state in the condenser to the kinetic state in the coil, and back from the kinetic to the potential state. It was pointed out above that when the vibrating spring is in its position of equilibrium, all of the energy associated with it is in the kinetic state; the speed of the weight supported by the spring is then a maximum and there is no molecular stress. In the oscillating circuit, the current through the inductance coil attains a maximum value when the charge in the condenser falls to zero, and when the condenser charge is at a maximum the current through the coil is zero. In between these points, as the condenser is dis-

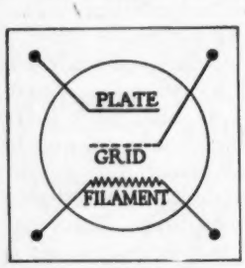


Fig. 1

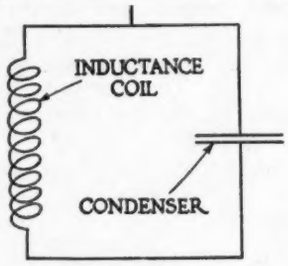


Fig. 2

Fig. 1—Diagram of three electrode vacuum tube with base
Fig. 2—Diagram of circuit containing inductance and capacitance, in which electrical oscillations will be set up by an eltctromotive impulse if the resistance is small

charging, the magnetic field of the coil is building up and as the magnetic field weakens the condenser is being charged.

In order to keep a vibrating body in constant vibration it is necessary that we give it a periodic impulse in the direction to which it happens to be moving at the moment. Every one knows instinctively how to time impulses necessary in order to keep a child in a swing going. The child and swing form a vibrating system of a given periodicity and the impulses must come at either the same frequency which forms a simple fraction thereof in order to achieve their object. In an electric oscillating circuit energy also must be added at a frequency equal either to the natural frequency of the circuit or to a prime fraction thereof, and if the oscillations are to be of constant value then the impulses must come at the same frequency as that of the oscillations. With a triode vacuum tube this supply of energy is accomplished as follows:

With the inductance coil in the oscillating circuit there is associated a secondary coil in inductive relation to it. One end of this secondary coil is connected to the filament of the vacuum tube and the other end to the grid. Naturally, an alternating current will be inducted in the secondary coil, of the same periodicity as the current oscillations in the oscillating circuit, with the result that the potential of the grid will soon be higher and soon lower than the potential of the filament. When the potential of the grid is lower than that of the filament, no current can flow through the tube, but when the potential of the grid is higher than that of the filament, current will flow. Hence there is a rush of current through the vacuum tube, and, consequently, a supply of energy to the oscillating circuit. This keeps the oscillations in the circuit going at a uniform rate.

A triode vacuum tube may be used for ignition purposes by including in the oscillating circuit the primary winding of a spark coil and connecting the secondary of this coil in circuit with the spark plugs and a distributor if necessary. The vacuum tube may be kept working continuously and the secondary of the spark coil switched from one plug to the next at the moment the charge in the cylinder in which the latter plug is located is to be fired. Alternately, the vacuum tube generator may be kept working intermittently.

Advantages of the System

Patents on a vacuum tube ignition system have been applied for in all industrial countries by Robert Bosch, and in some countries the patents have been issued already. Two advantages claimed for the system are that the ignition outfit can be placed anywhere on the car and that the ignition voltage is independent of the engine speed. Moreover, the most delicate part of the ordinary ignition system, the mechanical interrupter, is done away with, and attention is also called to the possibility of using the vacuum tubes simultaneously for the transmission of telephonic or telegraphic signals.

There are fundamentally two different methods as follows:

(1)—Continuous oscillations may be produced by the oscillating tube and there distributed to the plugs in the different cylinders at predetermined intervals and for given periods of time, the potential being stepped up if required, and

(2)—The tubes may be so controlled that oscillations are produced during the ignition period only.

The second system has the advantages that less energy is required, that the life of the tube is increased as the plate is charged only intermittently and for small fractions of the time of operation of the engine, that the ignition period can be more accurately adjusted and that opening of the plug circuits may take place when there is no current flowing in these circuits by merely arranging the contact segments to give a longer period of contact than the period of generation of oscillations.

The oscillating tube generator may be controlled by

1—Controlling the plate circuit

2—Tuning the oscillation circuit

3—Controlling the path of the electrons by magnetic or electric forces.

4—Altering the emission of electrons.

How It Is Controlled

The best method of control consists in applying to the tube grid during ignition periods such a potential as is nesessary for the operation of the generator and between such periods a lesser potential, at the same time interrupting the plate current and the grid current.

If distribution through controlled oscillation tubes is employed, then the working periods of the generator and distributer tubes are arranged to overlap for such periods as the ignition pressure is intended to remain on the plugs. This affords the advantage that the two controlling

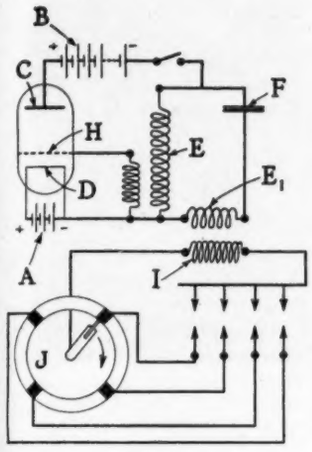


Fig. 3

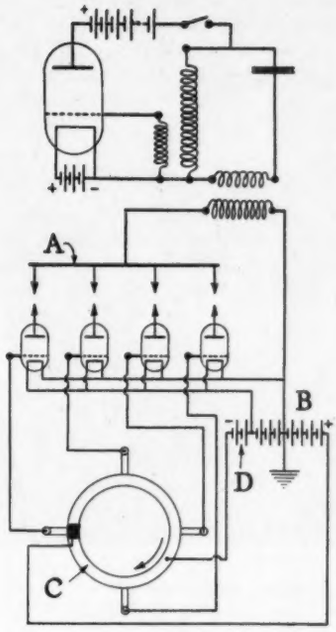


Fig. 4

Fig. 3—*Circuit diagram of Robert Bosch ignition system in which a mechanical interrupter is replaced by a three-electrode vacuum tube*

Fig. 4—*Circuit diagram of Robert Bosch ignition system in which three electrode vacuum tubes replace both the interrupter and the distributer*

members can be so adjusted that the ignition interval can be set at a suitable point in the working period of the generator.

One of the systems patented by Bosch is illustrated in diagram in Fig. 3. A is what is known in radio work as the A battery, which serves to keep the filament of the vacuum tube in a state of incandenscence so it will give off electrons. B is the B battery, the chief course of current for the operation of the system, the positive terminal of which connects directly to the plate C of the tube and the negative terminal of which connects through the oscillating circuit to the filament D. The oscillating circuit is made up of an inductance coil which in this case is made in two parts, E, E, and a condenser F.

In inductive relation with E is a coil G, whose terminals connect to the filament D and the grid H, respectively, and in inductive relation with E_1 is a coil I, in which are induced the oscillations which through the usual distributer are impressed upon the spark plug gaps and produce the sparks that cause ignition.

Another System Suggested

The second system is illustrated in Fig. 4. The apparatus for the production of sparks is exactly the same in this as in the previously described system, but the mechanical distributer is done away with and a series of vacuum tubes equal in number to the number of the cylinders to be fired is substituted for it.

One terminal of the secondary of what may be regarded as the spark coil connects to the bus bar A, from which connection is made to one terminal of each spark plug, while from the other terminal of each spark plug connection is made to the plate of a three-electrode vacuum tube. The other terminal of the spark coil secondary is connected to one terminal of the filament of each tube.

Electrical impulses therefore are impressed upon all of the ignition circuits or plug circuits continuously, and whether a spark passes or not depends upon the momentary potential of the grid in the tube. This potential is controlled by means of the voltage of a battery B, which is successively applied to the grids of the various tubes by means of the cummutator C. Battery D. supplies current for keeping the filaments of the tubes in a state of incandescence.

Whenever the grid of a tube is connected to the battery B its potential is higher than that of the filament, and a current will pass from the plate to the filament, that is, a spark will be formed at the points of the connected plug.

We are informed that the system here described has not yet been reduced to a state of commercial practice.

Bus Built Under License from American Company Shown in Front of the City Hall in Prague

AFTER extensive experience in the manufacture of six-wheeled trucks, Laurin and Klement of Mlada Boleslav, Czechoslovakia, recently completed the vehicle shown in the photograph, built under license from the Martin Rocking Fifth Wheel Co. of Springfield, Mass. It is shown in front of the imposing city hall of Prague, which lies half way between Vienna and Dresden, Germany.

This bus has a total capacity of 55-60 passengers, providing seats for 30 and standing room for 25-30 more. We are informed that the municipal Electricity Works, which apparently conduct the transportation service of the city, are at present considering the introduction of buses of this design in districts where the laying of trolley tracks would be objectionable or might involve greater expense than the possible return would warrant.

Six-wheeled motor bus built by Laurin & Klement under Martin Rocking Fifth Wheel license

Motor Street and the Colonnade Building which houses the Annual Automobile Show in Johannesburg, South Africa, and which is never big enough to house all the exhibits despite yearly additions

Attention is Centered on Closed Cars at the South African Show

Closed models have ceased to be considered a luxury since they have proved that they will stand up under the severe road conditions. Elections cause depression.

By M. Edward

THE feature of the annual automobile show at Johannesburg, South Africa, was the number of closed cars exhibited and the unusual interest displayed by visitors in this type. Until a year or two ago the closed car was considered a luxury.

People did not believe that they would stand up on South African roads, some of which are all but impassable certain months of the year. Consequently a closed car was looked upon as a town car in a country of vast spaces with the towns a considerable distance apart, and in which the automobile is considered a necessity.

Until it was proved that the closed car would endure the almost constant strain of the roads outside the cities, only open models were stocked. Closed jobs had to be ordered specially.

Most of the automobiles come from the United States or England, thousands of miles away. It means that not days or weeks, but literally months, must elapse between the placing of an order and receipt of the vehicle.

A car shipped from New York direct to South Africa is on the water twenty-eight days; if it is shipped by way of England two or three days may be saved. In addition, it has to be shipped from the factory, loaded onto the steamer, unloaded at the other end, taken through the customs and then finally sent to Johannesburg. Before closed cars were stocked, all the time needed for these preliminaries had to elapse between ordering and delivery.

Now all that is changed. The closed car has proved that it will stand up under the severest road conditions, and dealers carry them as a part of their regular line.

The annual show has been held in Johannesburg in conjunction with the Witwatersrand Agricultural Society's Show since 1911, and this year more passenger cars, trucks and buses were shown than ever before. It might be compared to a State fair in the United States. One hundred thousand people visited Milner Park, and of these about 99 per cent visited "Motor Street," as the thoroughfare on which the colonnade building stands, is called.

The long colonnade building has rather an interesting history. In 1916 the South African Traders' Association arranged with the Witwatersrand Agricultural Society to use the back of the grand stand for car exhibits. That year there were twelve "bays."

Every year the available space has been inadequate, though annual additions to the building have brought the number up to forty-one bays, each with a frontage of 9 ft. and a depth of 30 ft. This year additional space had to be obtained next to the colonnade building for some of the cars displayed. Motor Street was by far the most popular section of Milner Park.

The prizes which were offered by the *Sunday Times* and the *Rand Daily Mail* for the best-dressed bays were won by the distributors of Hudson and the Hupmobile.

In 1923 10,000 cars were sold in South Africa, and conservative estimates for this year, considering the temporary depression, would indicate a total of 8000. The show would tend to bear this out, for, while there was as much if not more interest than formerly, and a large num-

ber of prospects were listed, the actual number of sales was slightly less.

In Johannesburg, too, balloon tires and four-wheel brakes attracted a great deal of interest, though the only car fitted with balloons was the Citroen. There were nearly 100 cars displayed, including Buick, Cadillac, Chevrolet, Dodge, Durant, Essex, Ford, Hudson, Hupmobile, Lincoln, Maxwell, Nash, Oakland, Oldsmobile, Overland, Packard, Reo, Studebaker and Willys-Knight, of American manufacture. The English cars exhibited were Austin, Bentley, Crossley, Morris-Cowley, Morris-Oxford, Rover, Talbot and Triumph, and the European cars included Ansaldo, Citroen, Berliet, Fiat, Itala and Renault.

Trucks exhibited were Berliet, Ford, Leyland, Reo, Sentinel Steam Wagon and Thornycroft. The motorcycles shown were Ace, Harley-Davidson and Indian from America, and A. J. S., B. S. A., Chater-Lea, Diamond, Douglas, Enfield, Francis Barnett, Matchless, Norton, Ray, Raleigh and Triumph from England.

Local body builders had some very fine coach work displayed. Ford showed cars and trucks which had been assembled at his new plant in Port Elizabeth, Cape Colony, and there were a number of buses on view, while outside, motor buses competed with the street cars in carrying people back and forth from the city.

Where Winter Begins in April

The automobile show occurs in Johannesburg in April at the beginning of winter, for that is the time for touring in Transvaal, Natal and the Orange Free State. In summer during the rainy season in the northern half of South Africa the roads become almost impassable.

From the selling point of view the show was not on a par with the one held in Johannesburg last year, for a variety of reasons.

Motor traders are anticipating the possibility of a slight falling off in business, which means that they are carrying a smaller stock and that orders are somewhat hesitant. There is to be a general election this June, and business has slowed down as a result of the political situation.

It is thought that the Nationalist Party will come into power, and it always has been considered as revolutionary. Though it has convinced a considerable proportion of the population that it will do nothing to injure trade or drive away capital, there has been a general slackening of all business, and a tightness of money.

Another thing which is unfavorable is the lack of employment, and in addition to that there seems to be a tendency in the gold mines to use more negroes. The white population is seriously concerned.

There are only 1,500,000 whites in South Africa. A black man gets from 3 to 5 pounds a month, while the average for white employees is around £30.

The automotive industry has felt the slight depression less than almost any other, for the automobile in South Africa is looked upon as an absolute necessity. It is believed that even though the Nationalist Government should get into power, the elections will see the beginning of a reaction and the loosening of the country's purse strings.

There have been several dealer conferences with delegates from all parts of South Africa, for Johannesburg is considered to be the automotive center not only for that province, but for the Union and Rhodesia as well.

It was only last year that the Good Roads movement started, and already they are beginning to show results. Both the South African Party and the Nationalists have made the building of highways a plank in their platforms.

"Taperod" Offers New Welding Feature

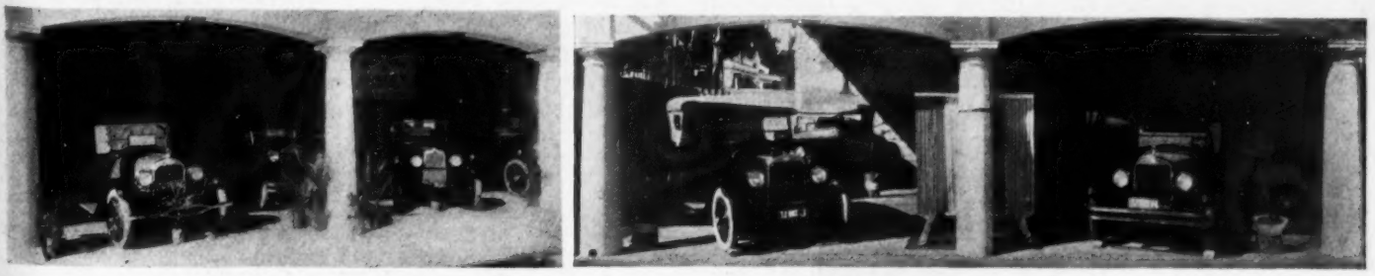
A NEW form of electrode for electric arc welding machines has been placed on the market by the Electric Arc Cutting & Welding Co. of Newark, N. J. It is of tapered form and is known as Taperod. The large end is gripped by the electrode holder and the arc therefore is started with the small end.

It has been found that in welding by this process an accumulation of heat takes place after the arc has been started, and as the increase in section of the electrode permits it to take care of more heat, this tends to compensate for that effect. By extensive experimenting the concern claims to have arrived at the correct degree of taper.

When welding with straight rod of the flux-coated type the welder aims to so adjust his current as to strike a happy mean between too cold a start and too hot a finish. Owing to the tapering section and the reduction in length of the electrode the resistance loss in the latter decreases rapidly as it is consumed. This resistance loss, of course, is one of the causes of the electrode overheating when it gets short. It is claimed that Taperod does not get red-hot as it gets short and that waste ends therefore are reduced to a minimum.

The chief advantage of the new rod is said to result from the fact that it increases the possible speed of production (or deposition). It is stated that of every dollar spent for electric welding about 80 cents is for labor, 10-15 cents for electrodes and the rest for electric current, hence the greatest opportunity for the reduction in welding costs lies in the direction of cutting down the labor item.

A COMMITTEE on Air Surveys appointed in England some time ago will shortly make its report. It will recommend surveying from the air of flat land, but has come to the conclusion that for hilly territory it is neither economical nor efficient, except in conjunction with other means. It is realized that photographic inaccuracies introduce errors and, besides that, it is impossible to fly at an absolutely uniform altitude, which is another source of error.



Each of the forty-one "bays" has a frontage of nine feet and a depth of thirty feet. Unlike our own annual exhibits, it is held at the beginning of winter and out of doors though it is roofed over

Engineer Opposes the Use of the Term "Mol" in Thermo-Chemical Calculations

The word means the number of weight units of any gas equal to its molecular weight, such as the gram-molecule, and has been advocated by the British Committee on Standards of Comparison.

IN thermo-chemical calculations a good deal of use has been made in recent years of the term "mol," by which is meant a number of weight units of any gas equal to its molecular weight. The weight unit most frequently used is the gram, and the full name for the unit mass of the gas, then, is the gram-molecule. However, the term can also be used in connection with the English unit of weight, and we then have the pound-molecule.

The advantage of this unit of mass results from the fact that at constant pressure and temperature equal numbers of molecules of all gases occupy the same space, hence the weights of different gases occupying the same space are proportional to their molecular weights. Therefore, under conditions of standard pressure and temperature a mol of any gas occupies the same space as a mol of any other gas.

In the thermo-dynamic equation

$$P\,V/T = R$$

in which V ordinarily represents the volume occupied by one pound of the gas, R has a different value for each gas, but if V is made to represent the volume occupied by one pound-molecule the value of R is the same for all gases. According to G. A. Goodenough and George T. Felbeck this value of R is 1544 if T is the absolute temperature in degrees Fahrenheit and P the absolute pressure in pounds per square foot.

For any particular gas the value of R corresponding to a pound mass can then be found by merely dividing 1544 by the molecular weight of the gas. In the case of air we have essentially a mixture of two gases of different molecular weights—nitrogen and oxygen. Nitrogen present in the proportion of 77 per cent by weight and its molecular weight is 28, while oxygen is present in the proportion of 23 per cent and its molecular weight is 32, hence the average molecular weight of air is.

$$\frac{(77 \times 28) + (23 \times 32)}{100} = 28.92$$

and the value of R for air therefore is

$$1544/28.92 - 53.4$$

R. W. Bailey Objects

In a recent report of a British committee on Standards of Comparison of the Efficiency of Internal Combustion Engines the suggestion was made that the mol should be used in the calculations. This suggestion is opposed by R. W. Bailey in a letter appearing in *Engineering* in which he points out several drawbacks to the plan. Mr. Bailey writes in part as follows:

The convenience of the constancy of R for one mol of any gas is upset by the change in the number of molecules of the charge which accompanies combustion. If combustion is complete, this change may be a reduction of anything up to about 8 per cent in the case of common industrial gaseous fuels and an increase up to about the same figure in the case of gasoline and other like easily vaporized fuels. The mass of the charge, however, in these cases is constant, and as engineers are accustomed to deal with unit mass in other thermo-dynamic calculations, the introduction of the kilogram-molecule or pound-molecule on the score of the constancy of R is likely to lead to confusion of thought without offering an advantage.

Another ground upon which the mol is recommended is that the molecular heat capacity of diatomic gases is approximately the same. It is not safe, however, to assume that because volumetrically nitrogen is a preponderating constituent of the working fluid, it dominates the heat capacity to anything like the same extent. If this were so, air might well be taken as adequately representative of the actual working fluid but, generally, this it does not do, because of the heat capacity of the triatomic molecules, CO_2 and H_2O present in the products of combustion. An examination of the most reliable data upon the specific heats of gases at high temperatures and interpolation in expressions based thereon (see later) shows that at 500 deg. C. (abs) and 2000 deg. C. (abs) N_2 (taken to include air) CO_2 and H_2O have the following molecular heats:

Molecular Heat per Degree Cent. at Constant Volume

N_2		CO_2		H_2O	
500 deg.	2,000 deg.	500 deg.	2,000 deg.	500 deg.	2,000 deg.
5.06	6.43	7.87	11.94	6.76	10.71

Cites One Example

Taking a case where the burnt gases consist of 75 per cent, $N_2 + O_2$, 14 per cent H_2O and 11 per cent CO_2 the heat capacities of equal volumes of the gas and air are in the ratios:

$\frac{\text{Heat capacity of gas}}{\text{Heat capacity of } N_2 \text{ or air}}$	500 deg.	2000 deg.
	1·11	1·19

Here it is seen that the heat capacity of the actual working fluid after combustion is nearly 20 per cent higher at 2000 deg. than that of the diatomic gases and 11 per cent higher at 500 deg. C. Obviously, the molecular heat of a diatomic gas does not sufficiently well represent the actual working fluid. It remains to inquire whether the molecular heat capacity of the actual gases suffers a greater or less change than that of unit mass as a result of combustion.

Considering producer and blast furnace gases the combustible constituents may be regarded as chiefly H_2 and CO. As whatever change takes place is due to the combustion of these two gases, it is only necessary to ascertain what happens when each is burnt with the required amount of O_2. The data given below have been calculated for combustion of each gas with the theoretical quantity of air for complete combustion on the basis of the following molecular heat capacities:

Gas. &	Heat Capacity per Mol per Degree C.
N_2O_2	$C_v = 4 \cdot 86 + 0 \cdot 284 \times 10^{-3}\,T + 0 \cdot 25 \times 10^{-6}\,T^2$
CO_2	$= 4 \cdot 56 + 7 \cdot 59 \times 10^{-3}\,T - 1 \cdot 95 \times 10^{-6}\,T^2$
H_2O	$= 7 \cdot 51 - 2 \cdot 54 \times 10^{-3}\,T + 2 \cdot 07 \times 10^{-6}\,T^2$

R for one mol $= 1 \cdot 987 = C_p - C_v$

T = temperature deg. C. (abs).

Let E = internal heat energy and I = total heat energy.

It is common to integrate equations for C_v and C_p to obtain E and I and to take these as zero when T is made zero in the resulting equations. Values of E and I so obtained have no definite physical meaning, since the expression for C_v and C_p do not hold down to T = O. It is more satisfactory, therefore, to choose a datum where the relations for C_v and C_p are more valid, and in what follows E and I represent energies above T = 273 deg. or 0 deg. C. In any case, heat engine calculations are based upon differences of E and I, and 273 deg. is a low enough datum for most practical purposes.

Accompanying figures show that in the case of CO heat energies E and I per unit mass suffer considerably less change due to combustion than do the same quantities per mol, and in the case of H_2 the advantage is slightly in favor of the unit mass. On the whole, therefore, the preceding seems to indicate that in gaseous fuels whose combustible constituents are chiefly H_2 and CO there is greater equality in the heat capacity before and after combustion of unit mass than for one mol.

Combustion of CO *and* H_2 *with Theoretical Air*

Reduction in number of molecules due to combustion=14.7 per cent in each case

Fuel	Energy above 0 deg. C.	*	T= 300 deg.	T= 500 deg.	T= 1,000 deg.	T= 2,000 deg.
CO	E for unit mass.....	B	4.7	39.76	131.0	336.1
		A	4.42	39.98	136.9	368.9
"	E for one mol.....	B	135	1,137	3,743	9,600
		A	148	1,306	4,591	12,380
"	I for unit mass.....	B	6.56	55.53	181.5	456.1
		A	6.02	52.43	179.9	471.2
"	I for one mol.....	B	188	1,590	5,185	13,040
		A	201	1,759	6,029	15,800
H_2	E for unit mass.....	B	6.41	54.4	179.2	459.8
		A	6.19	52.26	170.0	447.1
"	E for one mol.....	B	133.9	1,136	3,746	9,620
		A	151.6	1,281	4,163	10,940
"	I for unit mass.....	B	8.97	76.0	248.4	624.2
		A	8.38	70.67	229.0	587.2
"	I for one mol.....	B	187.3	1,587	5,190	12,030
		A	205.3	1,731	5,613	14,390

*B in this column denotes gas before combustion, and A indicates gas after consumption.

Measures Volume of Compression Chambers by Sound

AN apparatus for conveniently and accurately measuring the volume of the compression chambers of an engine and which is based on an accurate principle has been developed in France. The principle employed plays a part in an everyday phenomenon and it is rather surprising that it has not been more extensively applied in the past.

When a glass or jar is filled with water from a faucet, it is not necessary to look at the vessel to see when it is full; the change in the tone emitted makes it possible to tell when the vessel is full and it is time to shut off the faucet. Professor Charron-Godet of the University of Angers has applied this principle to what he calls a volumeter and which, among other purposes, serves for measuring the volume of engine compression chambers.

If we connect to the wall of a chamber filled with air at atmospheric pressure a short length of tubing connecting to a whistle, the air contained in the chamber constitutes a vibratory body, so that if a slight impulse is given to the whistle a series of vibrations is produced. Now the smaller the chamber the greater the rate of vibration. The chamber, therefore, produces a tone which is dependent upon its volume and the rate of vibration of which is inversely proportional to the square root of the volume. The form of the chamber is of no consequence in this connection.

If another similar arrangement is placed on a calibrated chamber in the form of a cylinder, so that the volume can be varied by means of a piston, the same impulse will set the air in both chambers into vibration, and usually the two chambers will give different tones. If, then, by moving the piston in the calibrated cylinder the two tones are harmonized, one can be certain that the two chambers are of the same volume. The unknown volume of the compression chamber can then be read off from the scale on the piston rod.

A particularly fortunate circumstance permits of bringing the two sets of vibrations into very close harmony. In consequence of the interference between two vibrations of nearly equal frequency the ear will detect very pronounced tremors or quivers. When the piston is moved in one direction these tremors increase, whereas when it is shifted in the opposite direction they decrease, and when they disappear altogether the two volumes are equal. Since the current of air does not produce an over-pressure in the chamber, the mean pressure of the air remains equal to atmospheric and it is not essential that the chambers and connections should be absolutely air-tight.

In practice the measuring device consists of a small wooden box with a grip handle for convenience in carrying it around. One half of the space in the box is occupied by the cylinder with its movable piston, while the other half is utilized for storing the necessary fittings or accessories. The spark plug is removed from the cylinder of which the compression chamber volume is to be measured and the whistle is put in its place. At the top this whistle ends in a T, from which one rubber hose connects to the air pump and the other to the cylinder in the wooden box. A rubber bag is incorporated in the connection to the air pump.

In addition to the whistle on the cylinder to be measured there is a similar whistle permanently connected to the cylinder in the wooden box. When air is pumped the current divides between the engine cylinder and the measuring cylinder, and by moving the graduated piston rod the two notes can be harmonized. Instead of using a pump, air or gas from a steel bottle can be used, and the rubber bag is then not required. It is claimed that the sensitiveness of the device is such that if one or two cubic centimeters of a fluid are introduced into the compression chamber the piston rod has to be moved in order to restore the disturbed harmony. As an average sized automobile engine cylinder has a compression volume of about 200 cu. cm., this would indicate a limit of error of less than 1 per cent.

THE Royal Automobile Club of Great Britain conducts a free towing service for its members and each year makes an analysis of the causes of breakdowns which necessitate tows. In 1923 10.2 per cent of all the breakdowns were due to accidents, the rest being due to mechanical failures, of which 44.4 per cent were engine troubles, 30 per cent transmission and brake troubles, 6.9 per cent front axle and steering troubles, 6.8 per cent road wheel and suspension troubles and 1.7 per cent electric lighting failures. Of the engine breakdowns 18.4 per cent were due to ignition troubles and 5.7 per cent to lubrication failure. Of the transmission and brake troubles 13 per cent are attributed to the rear axle.

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Business and Presidential Elections

THERE is little reason to believe that the presidential campaigns will have any detrimental effect on business for the rest of this year. It is an old idea that industry hesitates to go forward in a presidential year because of the uncertainty as to which party and policies will be in power in the near future. Examination of the facts probably would show that whenever there has been a slowing up in business during a presidential year economic rather than political causes were chiefly responsible.

This year there is less reason to worry about the effect of the elections on business than for some time past. No matter what party or individuals are sent to Washington next year, the new Congress is almost certain to act more constructively than has the one whose session has just ended. It seems to be agreed generally among business men of both parties that the Congress just adjourned came close to making a new record for inefficiency and failure to perform its functions properly.

So strong has this sentiment grown that the business men of the country seem likely to take a more active part in the selection of representatives and senators than ever before. A good many who have been only mildly interested in politics in the past are stating vigorously that they are going to make definite efforts to get a larger number of constructive statesmen in the next Congress.

Parts Distribution

DISTRIBUTION of parts is the most complex merchandising problem before the automotive industry at the present time. Various channels now are being used to move units from the parts or car manufacturer into the hands of the car owner. Nearly every means in use has certain merits, but frequently the channels of distribution cross one another and tangles result.

It is natural that the parts maker, the car and truck manufacturer, the car and truck dealers or distributors, and the automotive jobbers each should approach the question from the standpoint of their individual interests. Since these interests conflict in some respects, a certain amount of friction has been generated without anyone being entirely responsible.

The best interests of the car owner must be the final factor in determining the best way to distribute parts. But even when this fundamental has been accepted, as it has been by a majority of executives, finding out what methods will best serve those interests still remain a task of very considerable proportions.

It is almost a self-evident fact to those who have studied the situation carefully that the automotive jobber has performed and is performing an essential economic function in the work of distributing parts. Had it not been for the jobber, the sale and use of automobiles would not have been extended nearly so rapidly. Even today the car owner is enabled to get prompt parts service in many places simply because of the parts supplies carried by jobbers and held ready for prompt shipment to dealers and repair shops.

The car manufacturer, on the other hand, feels and has accepted responsibility for providing parts service to dealers through his branches and distributors. He has used this means of having worn-out parts replaced with units identical in type and quality with those incorporated in the original vehicle. His efforts along this line have been of major importance, of course, in giving the car owner adequate service.

The parts manufacturer, if he is to hold his production steady and if he is to stand behind his product with his name and reputation, must see to it that his units are available everywhere they may be needed and that they may be obtained promptly. His distribution in many cases involves utilization of some of the car dealers and distributors and of the automotive jobbers as well.

There has been some talk of the possibility of large car manufacturers building a full line of parts for their own and other cars where interchangeable units are used, and of marketing these parts through jobbers as well as through their own dealers. Such a move would meet with opposition, of course, from

the car distributors whose profits would be decreased materially by such a move.

These are only a few of the complexities involved in the problem of parts distribution. A free and friendly exchange of information and ideas between the various parties involved will be necessary to a final solution. Probably no single plan will be worked out to suit all interests, but cooperative analysis will go far toward preventing destructive competition and toward reaching the ideal of providing maximum service to the car owner at the lowest possible cost.

Spreading Out Responsibility

THE wide distribution of responsibility—both personal and financial—in the automotive industry, has been one of the chief factors in its relative stability during a period of rapid growth. While factories have exercised a greater or less control over the actions and policies of their dealer organizations, success of retailers and wholesalers for the most part has depended on their own initiative and efficiency.

Banks, finance companies and the personal credit of individual dealer establishments all have contributed to provide the funds necessary to finance time sales and to permit the industry to go forward rapidly. This wide distribution of financial responsibility has been a decidedly stabilizing factor; if one part of the industrial structure becomes weak at a particular time, the effect on the other parts is not nearly so great as it would be were there a higher degree of centralization of financial responsibility. This is an important point to be borne in mind when considering the possibility of manufacturers bearing a larger share of the burden of financing dealer stocks than they have in the past.

The individual responsibility of capable dealers has increased the sale of many makes of cars far beyond anything which might have been possible had the factory attempted to centralize and control the entire distribution system from one point. While the advantages of large organizations are apparent from many standpoints, there is a point of diminishing returns which, when reached, gives the decentralized organization certain very definite advantages.

Efficiency and Red Ink

AFTER several years of tremendous popularity "efficiency" came in for a bit of a setback a year or two ago when executives began to discover that it cost so much to be efficient in some cases that they were losing money by practicing the new-found art. A sane view of efficiency has become more prevalent of late.

The necessity of considering the reaction of human minds to mechanical methods and surroundings has come to be recognized in laying out plans for performing work more effectively. There is better understanding of the fact that true efficiency can be achieved only by giving due consideration to human as well as mechanical phases of the problem.

An important business executive summed up the question tersely the other day when he said: "Eighty-five per cent efficiency is all right; when you insist on trying for the last 15 per cent you are likely to get into red ink."

Industrial theorists probably would not subscribe to such a doctrine, but a good many practical business men have found it to be true.

Suction Gas as Motor Vehicle Fuel

IT was six or seven years ago that D. J. Smith in England first applied gas plants to motor vehicles and though a number of additional systems have made their appearance since and various improvements have been made, up to the present the system has not come into very extensive use.

In recent years the greatest interest in the system has been shown in France, where several competitions, notably for military trucks and for farm tractors, have been organized in which the use of solid fuel was compulsory and where several of the leading manufacturers have developed truck, tractor and rail-car systems employing suction gas plants. It may be, of course, that the movement to get away from imported motor fuel, which at first was directed toward the development of alcohol and alcohol mixtures, is now, after the virtual failure of the alcohol scheme, spending its accumulated momentum on gas producers.

Passenger Car Prices

THE opinion that car prices are going up within the next months or so is not held by all of the prominent executives in the industry, although there can be little doubt that an upward movement is intended in several important lines. Some already has taken place. The increasing cost of marketing and the need for a greater margin of profit are the factors pressing for rises, but other elements exist which tend strongly to hold prices where they are.

Higher retail prices theoretically give the dealer a greater margin on each car sold. In actual practice this does not always follow because a higher retail price usually raises the allowance which the dealer must make on old cars. Since a very large share of his business involves trade-ins, he gets a real advantage from the increased retail price only in a few cases, while sales resistance is likely to be increased to some extent.

Dealers have been clamoring for higher discounts, however, and price increases may be put through in some instances so that this demand can be met. The question of dealer discounts involves a good many complications which cannot be interpreted in a few paragraphs. Suffice it to say that higher discounts do not necessarily mean greater profits for the dealer, although they do mean greater opportunity for profit.

It is evident that prices as related to sales and dealer profits constitute one of the most immediate problems in the minds of many executives. It would be difficult to say, however, what action will be taken in any particular case.

Body Tax Exemption Covers Automobiles

Through Separation of Levy on Bodies and Chassis, Passenger Cars Benefit

NEW YORK, June 9—Not noticed at the time of its passage by Congress last month, one section of the new 1924 Revenue law pertaining to the automotive excise tax has since been interpreted to mean that instead of the complete vehicle being taxed as a unit, there now are two separate taxes, one on the chassis and the other on the body, paid by the manufacturer of each unit and with the duty paid at the source by the maker on the price at which he sells it.

It is through this separation that the passenger car end of the industry will be able to participate in the saving of from $25,000,000 to $30,000,000 a year to motor vehicle builders and users as a whole through the tax reductions which become effective July 3.

Trucks' Benefit Is Greatest

Truck makers and dealers are the chief beneficiaries because the Government has removed the duty on chassis selling at $1,000 and under and on truck bodies $200 and under, but their brethren producing and selling passenger cars must look elsewhere for their saving, because no change has been made in the 5 per cent duty applying to cars.

This will come, it is declared by those who have studied the measure, through the difference in the price at which the body builder sells his body to the car manufacturer, and what the latter, under the old law still in force, charges the consumer for the body as part of the complete vehicle. In other words, the new tax will be on a wholesale instead of a retail price basis, and here it is that the saving will be effected. It is a slight one, it is true, but still a saving, and the only one the passenger car folk get.

Profit for Car Dealer

A dealer handling a car made by a factory which buys instead of builds the body is the one who will profit by this, for the tax on the body is based on the body builder's price to the car maker instead of being set on the car maker's reselling price for the body, as under the present law. As defined by the present law, the complete car is now taxed as a unit on the wholesale price of the car manufacturer and includes the difference in price on the body paid by the car builder, and what he in turn charges the retailer for the body. Under the new code the tax is based on what the body builder gets for his product and is paid direct by the body builder.

As an example, take the case of a car selling wholesale at $700, of which $500 is chassis and $200 body. The present tax on the complete vehicle is $35, but if the car maker bought the body for $150, the duty under the new schedule would be $2.50 less.

This body angle will play an even more important part in the case of a dealer who fits a special body. In the past such a dealer has had to pay duty not only on the body at the retail price he charged, but on extra fittings, etc., and the Revenue Department has classified him as a producer. This no longer will apply, for when he buys his special body, the duty thereon will have been paid by

(*Continued on page* 1301)

Business in Brief

NEW YORK, June 11—Business is slack and industry lags compared with a year ago, but in making this comparison it must be borne in mind that 1923 was a record year, and that even if 1924 is limping so far, it is ahead of normal. It must be admitted, however, that the immediate present is dull, and that it was the business done in the earlier months that enables 1924 to keep its head above water.

Weather conditions are held to be mainly responsible for present conditions, although the uncertainty as to convention results has had its effect. But a backward spring has held up retail trade, retarded crop work and growth and affected the jobbers. Notwithstanding all this, conditions might be worse and there are cheerful ones who predict a pick-up shortly.

Industrially, the iron and steel trade seems to be still slowing down, although there is quite active buying of pig iron. Soft coal production is down and prices continue low, while in the oil field lower prices for crude prevail, with gasoline price cuts reported.

Shoes, cotton, woolen and silk goods and the apparel trades are moving slowly.

Revenue freight for the week ending May 24 showed a pick-up over its predecessor, continuing under the million car load total and showing a loss of 1.4 per cent as compared with the same week a year ago.

One bright spot is found in the report of bank clearings for the week ending June 5, which were slightly in excess of the week before, $7,716,140,000 compared with $7,531,692,000, but behind the same week of a year ago, which reported $8,111,416,000.

Extreme dullness characterized the stock market most of the week. Stocks were quiet and irregular, bonds were active and firmer and money easier.

Britain Not Looking for Big Price Drop

Some Makers Announce There Will Be No Change—Others Have Made Reductions

LONDON, June 2 (*by mail*)—Apart from the Finance Bill, unless a Member of Parliament has the hardihood to introduce an amendment to the Safeguarding of Industries Act during the present session, it is improbable that the McKenna duties will be given the opportunity of a dying kick.

The feeling seems to be growing among the British motoring public generally that the recent flare up, both on the part of the Protectionist Press and the Opposition, was more a political than an economic issue. Even the trade press is finding some room for letters deprecating the line of action that has hitherto been taken.

Duty Is Paid on Cost

It is becoming realized that price reductions will not be as great as were at first anticipated. Duty is paid on cost and not on selling price, while items such as tires are not affected. Moreover, a large proportion of British car imports come from Canada, whence the tariff was only 22 2/9 per cent. It is also possible for importing companies with British branches to invoice vehicles at their absolute nominal value, while news from America is to the effect that production costs tend to force prices upward.

One writer believes that American car prices will not be reduced more than 5 per cent, but it seems more probable that reductions in the fall will approximate closer to 15 per cent.

The refund plan has been adopted, in addition to those already mentioned, by Ford and Lancia. It is significant that some British makers are following this course. One leading dealer declares that buyers of A.C.'s or Singers will be given a written guarantee to the effect that the difference in price will be refunded if prices fall before next September. Wolseley extends this privilege to mid-October.

Intimates Higher Prices

Several distributors are taking the bolder step of cutting prices. Among the cars affected are Maxwell, Moon, Hudson-Essex, Delaunay-Belleville, Austro-Daimler and Ballot. De Dion Bouton is the only foreign make of car that has announced that its price will not be cut. Bean, Riley and Crossley have made similar declarations, the last even intimating that prices will go up rather than down. Calthorpe shareholders have refused to accept the directors' proposals to wind up, and production is to be maintained.

Stock Exchange quotations of the leading British automobile concerns show

(*Continued on page* 1309)

Fisher Body Netted $22,102,008 in Year

Big Increase Over Previous Fiscal Period—Surplus Increased to $31,157,875

DETROIT, June 9—Fisher Body Corp. reports net earnings of $22,102,008 for the fiscal year ending April 30, 1924, after providing for all interest charges and for Federal and Canadian income taxes. This compares with net earnings of $17,172,176 for 1923, and with $6,193,454 in 1922. The total surplus of the corporation is increased to $31,157,876.

Total assets of the company have been increased in the fiscal year to $107,633,151 from the $98,484,649 total at the close of the former fiscal period. Including $10,401,472 in cash and $24,607,209 in inventories, current assets aggregate $49,013,427 with current liabilities of $11,922,439, of which $8,618,246 consists of accounts payable, accrued payrolls and accrued interest. Provision for taxes is $3,250,000.

More Cash on Hand

Cash on hand at the close of the 1923 fiscal year was $7,674,720, and in 1922, $7,254,249. Inventories in 1923 were $24,801,475 and $12,655,552 in 1922. The ratio of current assets to current liabilities this year is 4.11 to 1, as compared to 3.06 to 1 last year. Property account for the 1924 fiscal period is increased to $55,610,215 from the 1923 figure of $41,541,303.

During the year the company's funded debt was reduced from $20,000,000 to $17,500,000. Expenditures amounting to $16,749,573 were made for extension of manufacturing facilities, the money being provided in part through the issuance of an additional 100,000 shares of no par common stock.

Stock Outstanding Greater

Capital stock outstanding is now 600,000 shares, the entire amount of no par value common stock authorized, with a valuation of $37,211,324. In 1923 there were 500,000 shares outstanding, with a valuation of $29,711,324. Capitalization also includes $8,129,000 of 8 per cent cumulative preferred stock of the Fisher Body Ohio Co., par value $100, a reduction from $8,844,000 a year ago. The capital also includes 1738 shares of common stock of the Fisher Body Ohio company of the stated value of $5 each, amounting to $91,505, with the proportion of surplus applicable thereto, a reduction from 2216 shares a year ago, when smaller surplus made the value $30,769.

Company earnings and income from all sources for the 1924 fiscal period were $26,607,163. Deductions from this of $33,920 interest on bank loans; $1,221,234 interest on funded and debenture debt, and the estimated $3,250,000 for taxes, setting up the net income of $22,102,008. Dividends paid during the year were $609,470 on the 8 per cent cumulative preferred stock of the Ohio company; $5,981,407 on the common stock of the parent body company, and $54,193 for accrued dividends on the Ohio company stock.

Chrysler Prices Up $100 and Maxwell $10 to $30

DETROIT, June 11—Effective immediately, the Maxwell Motor Corp. has announced increases in the list prices of the Chrysler and Maxwell cars. With the exception of the standard phaeton model, which remains unchanged, all Chrysler cars have been increased $100, while the advances on the Maxwell line range from $10 to $30 above the previous list.

The following shows the prices:

	Old price	New price
CHRYSLER		
4-pass. roadster	$1,525	$1,625
5-pass. phaeton	1,335	1,335
4-pass. phaeton	1,395	1,495
5-pass. standard sedan	1,625	1,725
5-pass. spec. sedan	1,895	1,995
5-pass. brougham	1,795	1,895
MAXWELL		
2-pass. roadster	875	885
2-pass. spec. roadster	975	...
5-pass. phaeton	875	895
5-pass. spec. phaeton	1,045	1,055
4-pass. coupe	1,195	...
2-pass. club coupe	995	1,025
5-pass. club sedan	1,075	1,095
5-pass. traveller sedan	1,585	...
5-pass. sedan	1,295	1,325

Prices of Locomobile Lowered $500 to $510

NEW YORK, June 12—Price reductions of $500 on the chassis, four-passenger sport, seven-passenger phaeton, touring limousine and carbiolet models and $510 on the brougham, victoria sedan and enclosed limousine are announced by the Locomobile Co. of America.

The new list puts the open models at $7,400 and the cabriolet is the highest priced closed job at $10,250.

J. Walter Tracy Drowned Trying to Save Friend

ROCHESTER, N. Y., June 9—J. Walter Tracy, vice-president and general manager of North East Service, Inc., lost his life by drowning in Lake Ontario on Memorial Day, while cruising with friends. Two of the party were swept overboard, and Mr. Tracy plunged after them. He saved one, and while trying to rescue the other, he was overcome by exhaustion and cold and sank before aid could reach him.

Mr. Tracy became associated with the North East Electric Co. in 1912, served in a civilian capacity in the Motor Transport Corps during the war, and when the North East Service organization was incorporated as a separate concern in 1921, he became its active head.

Ford's Sales in May Exceeded Production

Indications Are That Dealer Stocks Will Be Exhausted by the End of June

DETROIT, June 12—Final figures on Ford retail deliveries in the United States in May, counting only cars and trucks, show a total of 209,601, an increase over May last year of 38,000. It was the third consecutive month in which retail deliveries in the United States were in excess of 200,000. Retail sales exceeded production by approximately 50,000, bringing dealer stocks to a new low figure and indicating a total clearing off by the end of June.

Deliveries of Lincoln cars during the same month were 868, the highest total the company has yet reached. Beginning with March retail sales have set new records each month, May exceeding April by 106. All indications are that June will show a decided increase over May.

An unusual feature of the growth in Lincoln business as recorded is that it has taken place with a reduction in the number of dealers who are displaying the line, though all dealers as heretofore are selling it. The number of dealers maintaining Lincoln salesrooms and service is gradually being confined in all territories to those best equipped to handle it, this being part of the Ford policy in handling Lincoln business in connection with the rest of the Ford line.

Retail sales of Fordson tractors in May, both for industrial and agricultural purposes, are reported as continuing strong, an average of more than 300 daily being maintained in May.

Shipments of Casings Below Output in April

NEW YORK, June 10—Reports made by members of the Rubber Association of America, representing about 80 per cent of the industry, estimate that production of casings in April exceeded shipments by 294,037.

April output totaled 3,307,478, compared with 3,427,692 in March and 3,539,326 in April, 1923. April shipments this year were 3,013,364, against 2,990,872 in March and 3,079,743 in April of last year.

Inventory as of April 30 showed 6,164,226, compared with 5,763,084 in March and 6,088,272 in April, 1923.

Exports in April

WASHINGTON, June 11 — During April 113,135 automobile casings were exported, the average unit value being $12.40, according to the Rubber Division of the Department of Commerce. This compares with 102,240 casings in March at a unit value of $11.29.

Automobile tube exports in April reached 90,896, as compared with 97,338.

Industry Proceeding at Conservative Gait

June Will Not See Stepping Up in Production—Demand Is Governing Operations

NEW YORK, June 9—The major part of the automotive industry is operating on conservative schedules with little likelihood that any previous monthly production record of this year will be reached in June. There may be a stepping up in July or August, normally slow months in both the sales and production branches of the industry, but this will depend entirely upon whether the buying movement proves such as to warrant it and whether business conditions in general show improvement. Caution will govern operations until the manufacturers feel fully justified in a return to the high production programs in force during the past year.

This situation covers parts makers as well as car producers but there has been some pick-up noted in the truck branch of the industry due in great measure to the wider use being made of the motor bus. Every month this year has shown a step up in this branch of the industry from the month previous.

Stocks Move More Readily

At the present time reports indicate that accumulated stocks of cars in dealers' hands are moving more readily than at any time in the spring months. It is doubtful, however, if the purchasing that was expected to begin the latter part of March and continue through May will develop completely in June. Local conditions have been a retarding influence on sales and although these have changed somewhat during the last few weeks the uncertainty that prevails among business interests as a whole has appeared as a most important factor in sales resistance.

The May output estimate of 301,200 cars and trucks bears out earlier predictions of a general slowing up in automobile production. That figure is the lowest reached in more than a year but brings the total output for the first five months of 1924 to 1,749,543 as compared with 1,651,518 in the corresponding period of the previous year. For the full twelve months ended with May, 1924, output reached 4,210,517 as against 3,375,670 for the twelve month period ended with May, 1923.

This indicates the heavy operations prevailing in the industry up to the first of May, resulting ultimately in the accumulation of sufficient stocks to meet the spring demand as it occurred. The present slackening in production is the natural outcome and there is nothing in the situation to cause concern. Unemployment is by no means general in the industry, the slowing up being so arranged as to keep the greater part of labor employed although on shorter hours.

45,000 Cars and Trucks Sold by G. M. C. in May

NEW YORK, June 9—Sales of General Motors cars and trucks in May totaled 45,000, compared with 58,600 in April and 75,393 in the corresponding month a year ago, preliminary figures announced by the corporation show.

In the first five months of this year General Motors sales were 319,150, compared with 327,473 in the same period in 1923. As shown by the figures, May, with its 45,000 as against 75,393 in May, 1923, is responsible for this, for the total for the first four months of 1924 was 274,150, compared with 252,080 in 1923.

By months the sales have been:

	1924	1923
January	61,398	49,162
February	78,668	55,427
March	75,484	71,669
April	58,600	75,822
May	45,000	75,393
June	.....	69,708

N. H. Van Sicklen Resigns; McCord Manages Apperson

CHICAGO, June 11—D. C. McCord, president of the Apperson Brothers Motor Car Co., Kokomo, Ind., has assumed general management of the company following the resignation of N. H. Van Sicklen, according to official information from the factory today.

B. C. Buxton, who has been third vice-president, becomes vice-president immediately under the president. E. L. Apperson will continue in his capacity of vice-president and engineer. No other changes in personnel are contemplated, according to Mr. Buxton, who states further that the only change in policy will be in line of more aggressiveness.

Stockholders in G. M. C. Total 71,382 in Number

NEW YORK, June 9—An increase in the number of stockholders is reported by the General Motors Corp., which on Thursday of this week will mail dividend checks to 49,170 common stockholders of record May 19.

The total number of stockholders in all four classes now is 71,382, compared with 70,009 in the preceding quarter. At the end of the second quarter in 1923 the total was 67,417, while the peak quarter was the second in 1922, with a total of 72,665.

Parts Makers Follow Pace of Car Builders

Summer Likely to Prove Dull Season—Few Plants Operating on Full Time

NEW YORK, June 11—With small inventories on hand and with collections described as excellent, the parts makers find themselves at the beginning of the summer with little business on the books to keep their plants busy. Not many of the plants are running full time and none at capacity, while indications point to a few concerns shutting down in July because of slack conditions.

This condition is regarded as but natural, following as it does on the heels of the production drop among car manufacturers. The parts makers, it is said, have caught up with orders placed during the winter and early spring, when all car factories were being pushed to the limit in anticipation of another record breaking business this year. This has resulted in overproduction to a certain extent by parts makers who have been slowed by hold up of orders placed by car builders.

Situation Not Alarming

The situation, however, is not at all alarming, it is declared. Most of the plants have stocks on hand sufficient to care for the needs of their customers for from 60 to 90 days, stock that has been ordered but which has been held up waiting for shipping orders.

In some of the plants there is activity caused by material orders by car manufacturers who are getting ready to bring out new models, but it can be expected that business will be dull in this branch of the industry until car sales catch up with production.

Indications are that there will be an advance in the price of materials, which is reflected in the anticipated general advance in lists by car makers.

Marathon Receivership Continued Through July

AKRON, June 11—Announcement is made at the office of W. H. Jencks, receiver for the Marathon Tire & Rubber Co. at Cuyahoga Falls, that the receivership, which was to have been terminated last month, has been extended until the end of July, when creditors and court officials will canvass the situation.

Production of automobile tires has been reduced to less than 75 casings a day, while that of other rubber products has been considerably curtailed.

The operation of the company under the receiver was profitable in a small way until very recently, it was stated officially at the office of the receiver. The company was placed in the hands of a receiver at the request of Cleveland and Cuyahoga Falls banks made two months ago.

Clifton Again Named N. A. C. C. President

Starts on His Twentieth Consecutive Term—No Change Made in Other Officers

NEW YORK, June 11—Members of the National Automobile Chamber of Commerce at their annual meeting last week took account of stock in a long discussion on the general outlook. Conservative optimism was the keynote of the talks made by leading manufacturers.

Reports indicated improving conditions, the situation in California being particularly better. It was felt that June will be a good month, although not a record breaker, with July and August fair. The used car situation, it was reported, is better and credits are easy.

Dealers have ample stocks on hand, and the factories are running on conservative schedules, with production continuing on the basis of orders received from the field. Fundamental industrial conditions, coupled with the favorable farm outlook, give expectation of satisfactory markets for the balance of the year, it was brought out in the discussion.

Situation Calls for Caution

By and large, the feeling among the members was that the situation is one calling for caution and appreciation on the part of the industry that it cannot expect to do more than general business does. Much depends on the results of the political conventions.

The annual election resulted in the return to office of President Charles Clifton of the Pierce-Arrow Motor Car Co., who starts in on his twentieth consecutive term as leader of the automobile industry's trade organization and its predecessors. Colonel Clifton, in 1905, succeeded F. L. Smith of the Olds Motor Works as president of the Association of Licensed Automobile Manufacturers and has held the office since that time.

The rest of the officers also continue as before—Roy D. Chapin, Hudson, vice-president; C. C. Hanch, H.C.S., second vice-president of the passenger car division; Windsor T. White, White, second vice-president of the motor truck division; A. J. Brosseau, Mack, secretary, and H. H. Rice, Cadillac, treasurer.

Votes Essay Appropriation

In addition to authorizing the holding of a second World Motor Transport Congress at such time as may be selected by the Foreign Trade Committee, the Chamber voted $12,000 for the fourth annual National Safety Essay and Lesson Contest for 1924. This is the event, held under the auspices of the Highway Education Board, for which the prizes and general expenses are met by the N. A. C. C.

It also was voted to continue appropriations to the United States Bureau of Standards for research into the improvement of motor fuel.

N. A. C. C. directors will hold a special meeting in Detroit June 25 to take final action on the renewal of the cross-licensing agreement among members of the Chamber.

Light Truck Output Gains

NEW YORK, June 9—Truck manufacturers who are members of the National Automobile Chamber of Commerce assembled last week to discuss the outlook and plan for the development of their branch of the industry.

In the matter of production, they were informed by Secretary E. F. Looomis that in the first four months of this year N. A. C. C. truck makers showed an increase of 21 per cent in comparison with the same period of last year, while the general increase, all truck makers considered, was but 15 per cent.

From this it is deduced that, despite Ford's big production, such light trucks as Chevrolet, Dodge Brothers, Overland and Reo have been turned out in sufficient numbers as to offset the Ford and account for the N. A. C. C.'s production strength.

The survey showed that in the four month period light trucks from ½ to 2-ton capacity had a production 28 per cent better than in the same time in 1923. Trucks from 2 to 5-tons decreased 3 per cent, while the over 5-ton class increased 1 per cent. Averaging those over 2-tons, there was a 2 per cent decrease.

The meeting also considered the holding of regional motor transport conventions.

Upon invitation of the Motor Truck Committee, a delegation from the American Automobile Association, President Thomas P. Henry, General Manager Ernest Smith and Charles M. Hayes, discussed the advisability of organizing a section of the A. A. A. for users of commercial vehicles.

Kelly Truck's Earnings Last Year Were $190,049

SPRINGFIELD, OHIO, June 12—Net income of the Kelly-Springfield Motor Truck Co. from Dec. 16, 1922, to Dec. 31, 1923, totaled $190,049, from a total net sales of $2,046,153, according to figures included in special reports of Pearl A. Lewis, receiver, to the Common Pleas Court.

The inventory and appraisal of the company's assets made by order of the receiver places the valued real estate and machinery under mortgage at $571,584; other property not included in mortgage, $393,274, and miscellaneous equipment in branches in other cities, $1,000,228. The report is filed in the suit of the Bankers' Trust Co. against the Kelly-Springfield Motor Truck Co. in which the receiver was appointed.

According to Receiver Lewis the company has been enjoying a fair business since the first of the year, and prospects are encouraging.

White to Construct Plant for Research

Experimental Laboratory Will Be Moved, Permitting More Production Space

CLEVELAND, June 11—The White Motor Co. is building an experimental laboratory for industrial research work in connection with trucks. It is being erected opposite the plant and will house facilities interesting not only to men in the automotive field but to those in touch in a general way with industrial research.

The building will bring together all the experimental work of the company, now carried on in one of the factories across the street, as well as some physical and chemical testing done in plant-controlled laboratories.

With the new equipment the building will cost between $250,000 and $300,000. It will consist of a ground floor and basement, with a second story at the front, capable of being heightened to four stories, the whole to contain 55,000 sq. ft.

The removal of the laboratory from the plant will enlarge the manufacturing capacity for trucks. Acquisition of the White Sewing Machine Co. plant and the new laboratory together will increase space about 15 per cent. The company always has had a department for building new models and for trying out proposed changes in new products.

The addition will make possible transportation studies on a larger scale, and experiments can be conducted in more or less abstract scientific fields, although the present intention is to devote all laboratory work directly to the truck industry.

Business Demands Addition

President Walter C. White explained that construction of the engineering building does not mean that the company expects to bring out a number of new models of trucks, but merely that the business has grown to a point where a separate building is needed.

Truck engineering has to take into account the practice of most truck buyers of putting the vehicles into hard service immediately after they get them, in contrast with the motor car owner who often takes extreme care in breaking in new cars.

The new building will contain heat treating, physical, chemical and metallographic laboratories.

FORD PLANT AT DALLAS

MOLINE, ILL., June 7—The largest machinery and equipment auction sale in the history of this community closed last week with disposal of nearly $500,000 worth of Universal Tractor Co. (Moline Plow Co. unit) equipment to various bidders. More than 250 firms were represented in the bidding.

Government Agents Make Rubber Reports

Tell Manufacturers Results of Their Recent Investigation of Supply Sources

NEW YORK, June 9—Investigators of the Department of Commerce who recently returned from explorations and surveys in the Far Eastern and American tropics have been in conference with representatives of the American rubber manufacturing industry here, reporting the results of their trips, and their bearing on the possibility of producing enough American-controlled rubber to satisfy the needs of the industry in this country.

In their opinion the Philippines and parts of South and Central America provide regions where the climate and soil are suitable for first-class rubber plantations of practically unlimited area. Certain unfavorable economic and legislative factors must be considered carefully, however, before plantation projects can be started in those regions on a competitive basis with the large areas in the East, where 95 per cent of the world's output is now produced.

Outlining the situation briefly, it was explained that the total area planted in the East was found to be about 4,266,000 acres, of which 2,729,000 acres are owned by European and American capital and 1,537,000 acres by Asiatics.

Great Britain in Control

Through domicile of plantations in British territory and through ownership of plantations by British capital in other territory, Great Britain controls 77 per cent of the total area under rubber. American capital invested in the East is estimated at only $32,000,000, against $489,000,000 for Great Britain, $130,000,000 for Holland, $40,000,000 for Japan, $27,000,000 for France and Belgium, and $47,000,000 for other European countries.

The Commerce Department investigators believe that the operation of the British restriction laws, adopted in November, 1922, will probably reduce the aggregate potential output for the years 1924, 1925 and 1926 by upward of 200,000 tons of rubber. Rubber planted by the native population and old areas on European estates, which have not been properly cared for, are expected to show declining yields in the future.

Cab Stands May Solve Question in New York

NEW YORK, June 12—The taxicab situation, which had become acute through the inclusion of Broadway in the ban on cruising for fares, and the announcement that the no parking rule in the business district would be strictly enforced, has been partially solved. The Police Department has agreed to sanction one-cab stands on Broadway and Fifth Avenue corners, where the consent of property owners can be obtained, which will relieve the situation somewhat.

The Taxicab Board of Trade, alarmed because the crusade threatened to damage seriously the taxicab business in New York, has determined to test the powers of the police and carry the matter to the Appellate Division of the Supreme Court. Steps in this direction had been taken, one taxi driver purposely violating the cruising rule on Broadway and submitting to arrest.

Traffic congestion is being lessened in the business section through this activity of the police, who have cleared the streets of cars whose owners have been using the city thoroughfares for outdoor garages.

Coats Receiver Making Plans to Sell Factory

COLUMBUS, OHIO, June 12—John G. Price, receiver for the Coats Steam Car Co. of Columbus, which was forced into bankruptcy about eight months ago, announces that negotiations are in progress for the sale of the company's plant on South High Street. All other assets have been disposed of.

An inventory of the property at the time of the receivership showed real estate of $278,000 and materials and machinery valued at $20,000.

South America Buying Tractors, Says Evans

MOLINE, ILL., June 11—"The tractor business is just coming into its own in Argentina and other South American countries, and the prospects for business are particularly good at the present time," according to H. F. Evans, vice-president and managing director of the foreign trade department of the new Moline Plow Co., in correcting a misstatement printed by AUTOMOTIVE INDUSTRIES in its issue of May 8. In that issue Mr. Evans was quoted erroneously as saying that the low prices of horses made the tractor outlook dark in South America.

There was a large increase in the use of tractors in Argentina, Uruguay and Brazil last year, Mr. Evans went on to say, and business thus far in 1924 indicates that the total sales this year will surpass those of 1923 by a good margin. Tractors are being used for a wider variety of purposes in these countries than ever before, and as a result are bringing very real economies to South American agriculture.

AIRCRAFT TO BE STUDIED

WASHINGTON, June 11—House investigation of the aircraft industry will be carried forward during the summer recess of Congress, Chairman Florian Lampert of the special committee appointed for that purpose announces.

The inquiry will be conducted primarily with a view to working out a constructive program for aircraft manufacture and operation, along standardization of motors and machines.

Republicans Indorse Roads and Aviation

Their Platform Adopted at Cleveland Contains Planks on Both Subjects

CLEVELAND, June 11—Automotive interest in the Republican platform presented to the convention today is found in the planks referring to highways and commercial aviation.

"The Federal Aid Road act, adopted by the Republican Congress in 1921, has been of inestimable value to the development of the highway system of the several States and of the nation," says the Highways plank. "We pledge a continuation of this policy of Federal cooperation with the States in highway building.

"We favor the construction of roads and trails in our national forests necessary to their protection and utilization. In appropriations, therefore, the taxes which these lands would pay if taxable should be considered as a controlling factor."

On the subject of commercial aviation, the platform declares:

"We advocate the early enactment of such legislation and the taking of such steps by the Government as will tend to promote commercial aviation."

President Coolidge's remarks on taxation following the passage of the recent measure, when he declared that "the matter of tax reform is still unsettled," is incorporated in the taxation plank, which continues:

"We pledge ourselves to the progressive reduction of taxes of all the people as rapidly as may be done with due regard to the essential expenditures of the Government administered with rigid economy, and to place our tax system on a sound, economical basis."

Milwaukee Gives Permit to Operate Buses There

MILWAUKEE, June 12—After a legislative battle of more than a year, which started when the Milwaukee Electric Railway & Light Co. installed its first Fifth Avenue coach bus on Milwaukee streets late in May, 1923, the common council finally has voted to grant a permit to legally operate lines. The council at the same time denied the application of the Milwaukee & Suburban Motor Coach Co. for a similar permit.

The Electric company, which operates its buses under the name of Wisconsin Motor Bus Lines, immediately paid the sum of $10,025 in payment of the local tax prescribed in a city ordinance regulating buses, adopted some time ago.

The denial of the permit to the Milwaukee & Suburban, which is fostered by Chicago interests, followed reading of a telegram from Philadelphia, saying that the concern from which this line had ordered its fleet of buses had suspended business.

Men of the Industry and What They Are Doing

George W. McLaughlin Retires

George W. McLaughlin, treasurer of the McLaughlin Motor Co., General Motors' Canadian subsidiary, has retired from office after years of service in the business founded by his family 38 years ago. Mr. McLaughlin's brother, R. S. McLaughlin, continues as president.

Donaldson Serving with De Jon

O. M. Donaldson, formerly connected with Briggs & Stratton of Milwaukee, has been chosen sales manager of the De Jon Electric Corp., whose factory is in Poughkeepsie, N. Y. Mr. Donaldson is well qualified for his new duties because of his intimate knowledge of the requirements of manufacturers and because of his expert familiarity with starting, lighting and ignition systems.

Fred D. Sweet with Steel Products

Fred D. Sweet, formerly of the Biflex Corp. of Waukegan, Ill., and later with the H. L. Rackcliff Co. of Cleveland, has acquired an interest in the Steel Products Corp. of Sheboygan, Wis., of which he now is secretary and general sales manager. The Steel Products Corp. formerly was part of the Jenkins Machine Co.. As a separate corporation, it is manufacturing bumpers and other automotive products.

Kelley Appointed Sales Manager

H. Kelley has become general sales manager of the Stewart Motor Corp. of Buffalo, maker of Stewart trucks. For the last three years Mr. Kelley has been manager of the company's Pittsburgh branch and prior to that was district manager for several years.

Powell Is Factory Sales Manager

J. T. Powell has been appointed factory sales manager of the Flint Motor Co. of Flint, Mich., after having been identified for some time with sales promotion activities of the Flint company. For 14 years Mr. Powell was eastern district manager for the Apperson company.

Webb Named Advertising Manager

Leslie Webb, Jr., has been appointed advertising manager of the Automatic Electrical Devices Co. of Cincinnati, and will direct the advertising not only of the Homcharger, but also the new Kodel, a portable radio receiver made by the Kodel Manufacturing Co., also of Cincinnati.

Standish on Walker Sales Staff

W. Colburn Standish has been appointed to the national sales staff of Walker & Co. Mr. Standish is well known in Detroit through his connection with the Morgan & Wright Co., which later was merged with the United States Tire Co. He has been Detroit district manager and factory representative for U. S. Tire and recently has been sales manager for the Mailometer Co.

W. H. Day Organizes Company

W. H. Day, for 13 years sales manager of the Worthington Pump & Machinery Corp. of Cudahy, Wis., has organized the W. H. Day Co. of Milwaukee to handle various specialties, particularly those sold by Ford dealers.

Body Tax Exemption Covers Automobiles

(*Continued from page* 1296)

the body builder and at the price the latter got for it.

Right here there will be a considerable saving in the difference between the two prices, which at 5 per cent will mean something—20 per cent saving on a job selling at $1,000.

Another benefit to be derived by the dealer is that he no longer will be under the scrutiny of the Revenue Department, which will not be interested in his case, because duties on both body and chassis have been paid at the source. When the dealer has to collect the tax for his principal, the car maker, it will be a transaction between him and the factory and not under Government jurisdiction.

Simplifies Auditing

And the change of tactics also will relieve the Revenue Department from the necessity of auditing the accounts and watching the business affairs of 45,000 dealers. Instead it only will have dealings with a few hundred manufacturers of chassis, bodies and parts, thus greatly simplifying its work.

Truck dealers will profit more than the car retailers, for they will pay no tax on chassis selling at $1,000 and under or on bodies $200 and under. On bodies and chassis over these prices, it is pointed out that, whereas now most truck dealers buy bodies from one source and chassis from another, they now pay 3 per cent on the dealer's retail price, but under the new law dividing bodies and chassis, the tax on jobs over the exemption limit is levied on the maker's wholesale selling price, so that the tax burden is reduced about the same amount as the present discount that is allowed dealers.

Another money-saver is found in the change cutting the rate on tires, parts and accessories from 5 to 2½ per cent, which means a reduction of 50 per cent on service and repair parts to both manufacturer and service station. Tires coming in this category also means much to the maker, dealer and consumer.

Railway Will Extend Store-Door Delivery

Application Made by Detroit United Railways to Reach "Thumb" District

DETROIT, June 11—Application to run truck lines as feeders for its electric freight and express service in the "Thumb" district of Michigan has been made by the Detroit United Railways through its trucking subsidiary, the Detroit United Railway Trucking Co. This service, if the application is favorably acted upon, will be the second that the railway company has originated in Michigan and plans are practically complete for the extension of combination railway and truck freight and express service to several more localities.

Will Collect and Deliver

This service in the "Thumb" district provides for delivery by railway to Imlay City from which point truck service will extend to Brown City, Mariette, Elmer, Sandusky, Argyle, Ubly, Bad Axe and Harbor Beach. At all points along the truck route door-to-door collections and deliveries will be made.

The trucking company will not only handle shipments from and to Detroit but will also handle shipments between the trucking points. Time of service between Detroit and Harbor City, the extremes of the combined railway and truck routes, will be about 24 hours.

On the first service that the railway company instituted between Jackson and Coldwater, Hillsdale and Sturgis it has been operating six trucks for close to one year. The venture has worked out successfully leading to plans for extending the service t oother sections of the State of Michigan.

The Imlay City to Harbor Beach service will not have a definitely fixed number of trucks at the outset, this depending upon the amount of business to be developed.

Standard Equipped Trucks Used

The company is using and will continue to use standard equipped trucks for the present. As its plans develop it will use the special trucks with demountable bodies which it has been experimenting with and will also use the various sized containers which it has developed to permit of rapid loading and unloading. In its application for a permit to institute the new freight route, the company has the indorsement of the Detroit Board of Commerce which finds in the combined rail and truck service an important adjunct in the development of State business.

New Cleveland Line Appears This Month

Balloon Tires Regular Equipment, 4-Wheel Brakes Optional—Price List Higher

CLEVELAND, June 9—The Cleveland Automobile Co. will place a complete line of new models on the market June 15. The power plant in the new line is a six-cylinder, L-head engine, known as the Mileage Motor. An automatic lubrication system is another feature of the new car.

Balloon tires are regular equipment on all models, and four-wheel brakes are offered at additional cost. A new radiator design and improved body lines add to the attractiveness of the models. Price, which range from $10 to $100 above those on the preceding line, are as follows:

Phaeton	$1,095
Touring de luxe	1,195
5-pass. two-door sedan	1,395
5-pass. sedan	1,495
3-pass. coupe	1,295
Special coupe	1,395

The roadster model, which has previously been included in the Cleveland line, will be discontinued.

Two New Truck Models Produced by Bethlehem

NEW YORK, June 9—The Bethlehem Motors Corp. has added 2½-3 ton and 3-3½ ton models to its line of motor trucks and made numerous refinements in its 1 and 2-ton models. The 3-ton model has been discontinued. The 1-ton model is now equipped with steel wheels and 33 x 5 tires instead of the wood wheels and 35 x 5 tires used formerly.

The nickeled radiator is higher and broader, giving greater water capacity and improved appearance. Steel wheels have also replaced wood wheel equipment on the 2-ton model, and the tire sizes have been increased from 34 x 4 front and 34 x 6 rear, to 36 x 4 and 36 x 7 respectively.

Velie Adds Royal Sedan, Listed at $1,845, to Line

MOLINE, ILL., June 9—A new Royal Sedan, priced at $1,845 and completely equipped with accessories, balloon tires, disk wheels and hydraulic four-wheel brakes, has been brought out by the Velie Motors Corp. The new body model, which is mounted on the standard 118-in. chassis, is finished with three coats of high temperature, black, baked enamel. The wheels are in blue and are fitted with 6.20 tires. The upholstery is brown velour.

Regular equipment includes extra tire and cover, trunk and rack, two suitcases and hat box, waterproof trunk cover, aluminum bars on back of body, stop light, aluminum step plates, nickel plated radiator, motometer and bar cap, parking lights, rear vision mirror, windshield cleaner, clock, cigar lighter, vanity case, smoking case, flower vase, transmission and door locks, window regulators, sun visor and window shades.

The Royal Sedan is an addition to the present Velie line.

Mrs. C. S. Mott Receives Fatal Injuries in Fall

DETROIT, June 11—Funeral services for Mrs. Ethel Harding Mott, wife of Charles S. Mott, vice-president in charge of operations of the General Motors Corp., were held Sunday at Flint. Mrs. Mott died Friday as the result of an accident in which she fell from a window of her home and suffered internal injuries.

Mrs. Mott was born in Yonkers, N. Y., and was married June 14, 1900. Preparations were under way for celebration of Mr. and Mrs. Mott's twenty-fourth wedding anniversary when death intervened. Besides her husband and her parents, Mrs. Mott leaves two daughters and a son.

Zimmerschied Reports Florida Business Good

NEW YORK, June 9—K. W. Zimmerschied, formerly general manager of the Chevrolet Motor Co., is in New York, stopping at the University Club, after an extended residence in Florida, where he has been recuperating from the effects of a serious illness contracted in 1922. After a short visit he will return to his home at Seabreeze, Fla., near Daytona, where he has acquired business interests.

Speaking of conditions in Florida, Mr. Zimmerschied said:

> Sales of motor cars in Florida are very encouraging, in contrast to what I hear about business in other sections of this country. Florida is generally regarded by those who have not been there in recent years as being dependent upon its orange crop. While it is true that the citrus crop is the mainstay, it is being eclipsed by the phenomenal development of the truck garden industry.
>
> The advent of the motor car has meant a good roads movement which is second to none in the country. Special attention is paid to the system of cross-State highways which has opened up enormous tracts of fertile land. In turn the good roads has meant a big demand for passenger cars and light trucks from farmers who are using this means of transportation to bring their crops to market.

HALLADAY OPERATIONS

DECATUR, ILL., June 11—The L. P. Halladay Co., which several weeks ago purchased the Comet automobile plant buildings to be utilized for its bumper manufacturing department, is awaiting arrival of machinery before the new unit goes into operation. Only preliminary operations for its occupancy are going on now. The Pan-American plant, however, has been converted into an assembling unit for the Halladay shock-absorber.

Olds Dealers Bring Stocks to Low Point

Resumption of Heavier Operations at Plant Is Likely to Come as a Result

DETROIT, June 11—Curtailed production at the Olds Motor Works during April and May and continuing into June has made it possible for the company's dealer organization to bring car stocks to low figures, which presages the resumption of heavier operations in the near future. Retail sales and deliveries of cars for the first four months of the year are far in excess of any previous year's business.

Sales and deliveries of cars at retail during May were 61 per cent in excess of those for the same month last year, 11 per cent in excess of sales for April this year, and 66 per cent better than March. Barring the heavy production of the late months last year and the early months this year, retail business of this strength would mean full capacity operation of the plant now and for many months to come.

Organization Kept Intact

Sufficient business is coming from dealers now to keep the plant operating at a rate of capacity that permits keeping practically the entire production organization intact. There are actual shortages in many parts of the cuontry for particular models in the Olds line. Demand for these in particular and for the rest of the line in general is keeping things moving steadily. The company is fully convinced of the certainty of good fall business.

Olds cars exported in the first quarter of the year totaled close to 400 per cent more than in the same period last year. In January 386 were shipped abroad, February 678, March 481 and April 476. Australia is declared the principal export market for Olds cars, with the South American markets, tne Argentine especially, next.

Fageol Bus Production Now Exceeds 50 Monthly

OAKLAND, CAL., June 11—The Fageol Motors Co., notwithstanding the hoof and mouth disease which has been affecting the Pacific Coast business for many months, has been increasing its production of motor buses rapidly and is producing more than 50 coaches a month.

Business for June would indicate an increase of approximately 50 per cent in this schedule. The operation of certain motor staging businesses in California has been interfered with very seriously by the hoof and mouth disease, but reports from many parts of California indicate that business is picking up and that the crisis in the situation has been passed.

U. S. Foreign Trade Outlook Discussed

Fifteen Hundred Delegates at Convention Hear Talks on Greater Prosperity

BOSTON, June 7—The eleventh national foreign trade convention, which ended here today, was attended by upward of 1500 delegates, representing industries in all parts of the country. The number was considerably below that of former years. Due perhaps to the fact that the subjects taken up for discussion generally related to problems common to all industries and offered no individual appeal, the attendance of representatives of the automotive industry was not nearly so great as in the past.

Farrell Opens Convention

The program of the convention was "Greater Prosperity to Greater Foreign Trade," the opening address being made by James A. Farrell, president of the United States Steel Corp. and chairman of the National Foreign Trade Council, under whose auspices the convention was staged. In his remarks Mr. Farrell showed the necessity of foreign trade to the development of American industries. He declared that inasmuch as the United States needed raw materials from foreign lands for its industries, it has become a national duty to sell its products in those lands in order to obtain a raw material supply.

The subject of export advertising appropriations was one of unusual interest, and its discussion occupied an entire session. W. F. Earles of the United States Rubber Export Co. championed the decentralized method of making appropriations and handling export advertising, and Paul R. Mahony, representing the Eversharp pencil interests, spoke in favor of the centralized system.

Special interest was taken in the explanation by Fred I Kent, vice-president of the Bankers Trust Co. of New York, of the Dawes plan. Mr. Kent believes the adoption of this plan will result not only in stabilizing German currency on a gold mark basis, but means that Germany has made up her mind to put herself on her feet, an action that will be a great stimulus to all other European countries.

Resolutions Adopted

In its resolutions the convention went on record on different subjects related to industry as follows:

Foreign Trade—Foreign trade is an absolute economic necessity. Without it our industries would wither and dwindle and we would be unable to comply with the fundamental condition of prosperity—steady occupation of all our workers in all lines of industry. Exports make possible the largest continuous occupation of labor and capital.

Raw Materials—The importing of raw materials is essential to our national prosperity. Some of our large lines of industry, such as rubber and silk are dependent wholly or subtantially on materials obtainable only from foreign sources.

Export Problems—In our domestic industry we have developed the four great factors of enterprise, namely production, transportation, communication, and finance to the point of highest efficiency. But in our foreign trade there is still necessity for effort in all these lines.

Finance—Finance performs two great services in the maintenance and promotion of foreign trade. It facilitates individual purchases in sales, and it paves the way for the development of new business. It is in the field of investment of foreign countries that American finance has its largest opportunity for the promotion of American foreign trade. It is of the utmost importance that our investment bankers when negotiating foreign loans should always have in mind so to handle them as to further American trade; and they should, as far as practicable, provide for the expenditure of an appropriate portion of the proceeds in this country for prompt rather than ultimate exports.

Taxation—The system of Federal taxation imposed upon this country forcibly supports the suggestion that it was intended by its framers to defeat instead of encourage our foreign trade. High sur-taxes not only restrict the floating here of foreign loans, that would be so helpful to our industries, and so promote the occupation of our people, but cut down to a minimum the free capital which otherwise would seek industrial investment and force it into securities that are exempt from income tax.

Imports—The United States offers to the industry of all nations the greatest market in the world. Its market is open to all without discrimination.

Foreign Trade Zones—We need an effective system of foreign trade zones enabling efficient handling, cleaning, grading and mixing of foreign merchandise for re-export.

Immigration—The regulation of the admission of aliens to our shores is a domestic question, but it should be handled without needless impairment of our friendly relations with other countries.

Europe—We face an international situation of unusual complexity and interest. There is new ground for hope of an effective settlement in Europe. When that is attained the steady progress toward recovery which Europe has been making in the last five years will be accelerated. Her competition with us and other countries will increase correspondingly. Our ability to meet competition in many lines and many fields has been amply proved. The new situation should inspire us with energy, persistence, and courage. It is a time for activity, vigilance, enterprise and hope.

The 1925 convention will be held in Seattle, Wash., in June.

Durant to Center Flint Operations in Michigan

NEW YORK, June 9—Production of Flint cars at the Long Island City plant will be discontinued after the initial schedule of 500 of Model 40 has been completed. The plant will then be devoted to service work for Flint, Star and Durant cars in the Metropolitan territory.

It also will continue to house the Durant engineering and experiment departments and be headquarters of the material, purchasing and accounting departments for all Durant enterprises.

Akron Tire Builders on Profitable Basis

Indicated That Earnings of Almost Three-fourths of Them Are Satisfactory

AKRON, June 9—Figures prepared by statisticians of one of the larger rubber companies during the week show that almost three-fourths of the tire companies in Akron are operating on a profitable basis.

The companies which are showing earnings very nearly equal to pre-depression years account for a total of more than $190,000,000 worth of rubber business of the $304,000,000 done in the city during the past year. While these figures include other than tire business the proportion is very small.

The Firestone Tire & Rubber Co., the General Tire & Rubber Co. and the India Tire & Rubber Co. are earning and paying dividends on common stock.

The Goodyear Tire & Rubber Co. is showing earnings of approximately $1,000,000 a month on an estimated business of more than $100,000,000 a year. Miller Rubber Co. showed 10 per cent net on gross business last year after a large write off for depreciation and continues on an even better earning basis this year.

It is believed that when some of the half year statements are made available after the middle of the year profits for the first half will be shown to establish new records.

Goodrich Earnings

The program of curtailment of overhead and sales costs which was inaugurated by President B. G. Work of the B. F. Goodrich Co. six months ago is to a large extent completed, with the result that the profits to be obtained from sales in the future will be much more satisfactory to stockholders and more in line with profits shown by other companies, according to semi-official reports available at the factory.

The forthcoming half year statement will reflect the savings only in part because in many instances they have not been in operation sufficiently long to give a full account of themselves, it is stated, but the second half of the year's business, either good or bad generally, will be much influenced by the curtailment program.

Output of Makers to Decline

That automobile tire production will drop to less than 70,000 tires a day in the Akron district during the next two months is the prediction heard in many quarters of the rubber industry here.

A drop below this figure, it is stated, will mark a new low figure for the industry in Akron since the depression days when production was reported in some instances to have been below 50,000 tires a day.

At the present time output is below 85,000 tires a day.

Medal Will Be Given to Further Air Work

Dayton Section of S. A. E. to Reward Best Contribution to Aeronautical Science

NEW YORK, June 10—The Dayton Section of the Society of Automotive Engineers will give a medal annually as a prize for the most meritorious contribution to the science of aeronautics reported to it during the year and has appointed a 1925 Award Committee, consisting of Prof. E. P. Warner, Massachusetts Institute of Technology and H. M. Crane, president of the S. A. E. In addition an airplane designer and a test pilot will be designated.

The contribution to, or the discovery in, the science and art of aeronautics may include advances in aerodynamics, development in the construction of airplanes, their powerplants and accessories, which will increase their efficiency or reliability in performance or flight, such as fuel systems, control mechanisms, instruments of aerial navigation, and the like.

Non-Military Improvements

Improvements of a nature having mainly a military application, such as ordnance or aerial photography, are not included in the list of subjects for which the prize may be awarded. It is the intention to award the prize for contributions designed to stimulate increased nonmilitary use of heavier-than-air craft.

The prize may be competed for by any individual citizen of any country, or group of not more than two individual citizens, without restrictions, excepting only that officers of the parent society, officers of the Dayton Section, members of the Contest Committee and members of the Award Committee are ineligible.

The award will be made for the intrinsic merit of the achievement itself, rather than for the merit of the paper describing it. Flight tests are considered highly desirable, and it will be advantageous to the competitor to be able to include in the paper a complete report in regard to flight tests.

Not Insisting on Flight Tests

Flight tests, however, will not be absolutely insisted upon, as it is recognized that a proposed improvement might be such that tests by an individual would be financially impossible and yet the improvement would be clearly evident to a competent Award Committee.

The paper describing the achievement for which the medal is awarded must be presented originally before the Dayton Section of the society, either by the prize winner or, if this proves impracticable for any reason, by some member of the local section appointed by its officers. The awards for 1924 will be on the basis of papers received up to Dec. 31, 1924, and will be announced thereafter as soon as the necessary work in checking up the various papers received and the data contained therein can be completed.

The Dayton Section reserves the right to withhold any award if, in the opinion of the Award Committee, no paper of a proper standard has been submitted. The section reserves the privilege in future years of restricting the competition to a narrower field of endeavor than is announced for 1924. However, any such restrictions will be announced by Jan. 1 of the year during which they are operative.

General Motors Truck Analyzes Buying Field

DETROIT, June 10—A sales analysis by the General Motors Truck Corp., covering business since the first of the year shows that the largest volume of truck buying has come from the general transportation field, due to the large increase of truck and bus use in intercity and interstate hauling. A large part of this business has come from railroad companies, and the company declares its expectancy that there will be a continued volume of large buying from railroads as the truck becomes more generally substituted for general short haul work.

The sales analysis shows further a steady expansion in the use of tractor trucks in intercity freight hauling, the trend being distinctly toward this type of vehicle combination as making for increased economics.

Staple industries, which have shown most prominently in truck buying in the early part of the year are oil, public utilities, general food products, building construction, furniture and warehousing. Sales generally as recorded in the early months of the year indicate a banner truck year, the company declares.

New Willys-Knight Coupe Carries Price of $1,740

TOLEDO, June 11—A new coupe listing at $1,740 has been added to the Willys-Knight line. It is designed particularly to fill the needs of the professional man or the small family. The front seat is wide enough for three persons, and ample head and leg room is provided. The doors are 30-in. wide, have inside pockets and swing on concealed hinges. Windshield is one piece with inside nicked-plated lever locking quadrants.

Equipment includes Folberth automatic windshield wiper, sun visor, rear view mirror, vanity mirror built into rear quarter and interior lights. Rear deck space is ample for a small steamer trunk and a separate compartment with lock will carry a medicine case or two or more bags of golf clubs.

The standard finish is dustproof gray above the streamline body molding and beaver brown below. The molding line is black, and top, back and rear quarters are done in black imitation leather. The top is of Duratex. Several optional color finishes are offered with this model.

Brake Lining Makers Press Test Movement

John A. C. Warner of S. A. E. to Address Association on Proposed National Code

NEW YORK, June 10—John A. C. Warner of the Society of Automotive Engineers will address the meeting of the Asbestos Brake Lining Association, to be held at the McAlpin Hotel Wednesday, June 18. He will discuss the proposed national code for standard methods of testing automobile brakes.

The association is continuing to press the national brake inspection movement, and special campaigns are being staged weekly in various cities to impress the motorists with the importance of having their brakes tested at periodic intervals.

A. A. A. Seeks Uniformity

WASHINGTON, June 12—Need for uniformity in brake regulations, which are now declared to be in dangerous variation, is being presented to the public as a result of an investigation of the brake laws of the country by the legislative committee of the American Automobile Association.

The primary purpose of the investigation, it is stated, was to reveal to the American car owner and all those vitally interested in traffic safety of the need for unifying brake laws.

When the digest of State laws regarding automobile brakes was submitted to Thomas P. Henry, president of the A. A. A., he declared that in view of the supposed interest in safety the facts with regard to brake regulations are nothing short of startling.

"I feel confident," Mr. Henry said, "that the legislative committee has unearthed one of the basic reasons for the abnormal number of traffic accidents and fatalities, and I am hopeful that the news of this investigation will cause motorists and authorities everywhere to make every effort to put brake regulations on a plane where they will be worthy of general adoption."

According to the report of the committee, practically all of the States use the stereotyped formula that brakes shall be "good and sufficient" or "adequate," terms which the committeee believes are subject to too wide an interpretation where such interpretation must of necessity by made by policemen and brake inspectors.

ENTERS PIKE'S PEAK CLIMB

DENVER, June 9—The first factory entry for the sixth annual and final Pike's Peak national hill climb for the Penrose trophy, which will be held Labor Day, has been made by the Lexington Motor Co. of Connersville, Ind. Ott Loesche, who drove the Lexington to victory in the 1920 climb, will have the mount.

Trolley Men Discuss Traffic Congestion

Meet with Representatives of N. A. C. C. and Will Work Out a Feasible Plan

NEW YORK, June 9—Traffic congestion was the theme of discussion at a joint meeting of committees representing the National Automobile Chamber of Commerce and the American Electric Railway Association, held at N. A. C. C. headquarters last week.

The two organizations, drawn together in this way in a common cause, were agreed that each suffers through overcrowded thoroughfares and together they are seeking a remedy.

Representing the Chamber was the committee appointed to meet the trolley people, A. J. Brosseau, Mack, and A. H. Swayne, General Motors, with T. R. Dahl holding the proxy of Windsor T. White, who was unable to attend. In addition David C. Fenner, chairman of the Motor Vehicle Conference Committee, and Alfred Reeves, Edward F. Loomis and Russell Huffman of the N. A. C. C. sat in.

Representatives at Meeting

The A. E. R. A. sent L. S. Storrs, president of the Connecticut Co.; R. T. Stevens, president of the Republic Railways & Light Co. of New York; C. D. Emmons, president of the United Railways & Electric Co. of Baltimore; M. D. Lambert, manager of the railway department of the Westinghouse Electric & Manufacturing Co.; F. R. Coates of the Henry L. Doherty Co. of New York; J. G. Barry, vice-president of the General Electric Co. of Schenectady, N. Y., and J. W. Welsh, manager of the association.

The joint committees decided to try to work out a feasible plan that both associations can indorse, which will assist in solving the traffic problem and permit of faster traveling in congested sections of both the motor vehicle and the trolley car. With this idea in mind a careful study will be made of surveys which have been held in Indianapolis, Toledo, Toronto, Cleveland and other cities, in the hope that some solution may be reached. Another meeting will be held in the early fall, when these reports will be given careful consideration.

Bus Figures in Solution

In arriving at this possible solution, it is figured that the motor bus will play a prominent part, the trolley people expressing a great interest in what used to be considered a rival of the street railway.

Among the suggestions discussed was one that favors the segregation of vehicular traffic, confining one main thoroughfare to street cars and another to motor vehicles. It was pointed out that New Haven, Conn., has done this successfully for the last 14 years in handling football crowds. The day of the big game New Haven gives over one street to the trolleys, another to motor vehicles and a third to pedestrians, and it is said that under this system immense crowds are handled with little trouble.

Discussing the prohibition of parking on business streets, Mr. Swayne, who has just returned from an extended western trip, said that he had noticed that western cities were enforcing the no-parking rule, with the result that traffic moved much more fully. Believing that perhaps this stringent rule may have affected the sale of motor vehicles, he talked to General Motors representatives, who declared that they had not noted any affect on their business because the authorities would not permit the parking of cars in business districts.

Work on Safety Proving Effective in Factories

NEW YORK, June 9—Comparatively small percentages of increases in frequency and severity rates have been reported to the automotive sections of the National Safety Council, despite an increase of 41 per cent in the number of hours worked in 22 automobile factories, automobile engine plants, metal stamping and other light metal working industries. These companies employed approximately 120,000 workers in 1923, and their reports show that the frequency rate was 3 per cent and the severity 6½ per cent.

About half the men in this group were in one large plant, which, however, did not overshadow the experience of the others. If this one plant is eliminated, the figures for the remaining 21 companies show the following increases in 1923: Hours worked, 35 per cent; frequency rate, 3 per cent, and severity rate, 10 per cent.

Practically all companies reporting have been doing safety work for a number of years, and the rates in all for both 1922 and 1923 are far below the rates existing before organized safety work was undertaken. With the large increase in the employment, meaning the introduction of a large number of new men, the very small increase in accident rates seems credible to the safety work of these companies.

The National Safety Council finds that the increase in severity rates is partly due to more accurate reporting of permanent disabilities, especially by the smaller companies, due to a new report form which emphasizes more clearly the heavy charges of lost time for permanent disabilities.

NEW GRENADA TARIFF

WASHINGTON, June 11—Automobiles are excepted in the 50 per cent increase in the ad valorem duties made effective in Grenada Dec. 21, 1923, by an ordinance assented to Feb. 1, 1924, the Bureau of Foreign and Domestic Commerce has been informed from its Brussels office. It is said that in the new schedule, with but a few exceptions, the specific duties remain unchanged.

Commission Writes Report on Gasoline

Submitted to President—Publication Awaits Justice Department Findings

WASHINGTON, June 12—The results of nearly a year's investigation of alleged monopoly and price-fixing in the gasoline industry were laid before President Coolidge this week by the Federal Trade Commission.

The report was referred immediately to Attorney General Stone, who placed it in the hands of his assistant, A. T. Seymour. It was not made public. The Department of Justice has been conducting a probe along similar lines with a view to ascertaining whether prosecution can be instituted under the Sherman anti-trust act.

The explanation for the withholding of the report from publication was that the investigation was undertaken, both by the commission and the Justice Department, at the request of the President. It is believed the findings will be kept from scrutiny until the department report is assembled, the two are combined and the President is given opportunity to study the whole mass of data.

Coincident with this news comes word from Pierre, S. D., that six carloads of gasoline purchased by South Dakota has gone on sale in Watertown, Aberdeen and Rapid City at 18 cents a gallon, including the 2-ton tax. The sale is being conducted on a larger scale by the State than that of last fall, when Governor McMaster put forth a program of sale of gasoline which led to changes in retail prices throughout the Central West and Northwest.

Trucks to Be Exhibited at Bottlers' Convention

WASHINGTON, June 10—Secretary Junior Owens of the American Bottlers of Carbonated Beverages announces that at the annual convention and exposition of the association, which will be held at Louisville Nov. 10-14, there will be an exhibition of motor trucks similar to the one promoted last year at Providence. The Bottlers are greatly interested in this form of transportation.

Eight truck companies already have engaged space, the list including the Federal Motor Truck Co., General Motors Truck Co., International Harvester Co., Graham Bros. Truck Co., Mack Trucks, Inc., G. A. Schacht Motor Truck Co., Service Motors, Inc., and the White Motor Co.

FLINT LONG ISLAND OUTPUT

NEW YORK, June 10—Starting production of the Model 40, its new light six, on April 30, the Flint Motor Co. at its Long Island City plant turned out 300 cars in the first month of operations.

Regrinders to Start Publicity Campaign

Aim to Reach Owners with "Rebuild the Car and Save the Difference" Slogan

CHICAGO, June 11—What was classed as senseless depreciation of automotive rolling stock was one of the chief topics of discussion at the annual meeting of the National Motor Regrinders & Rebuilders Association, held here last week.

It was claimed that motor vehicle owners do not utilize more than 50 per cent of the mileage built into their cars, and it was estimated that the value of the unused service is greater than the annual corn crop of the United States.

Preliminary plans were made for a publicity program designed to awaken the public and the trade to the fact that maintenance is more and more becoming an economic problem which sooner or later must be reckoned with. The slogan, "Rebuild the Car and Save the Difference," was adopted as expressing the views of the association, and it will be featured in all future organization and promotion efforts.

Business Best Since 1921

Although reports regarding conditions in the regrinding industry varied considerably, it was indicated by the majority of the delegates that their business generally is in better condition than at any time since 1921.

That the established regrinding concern need not fear competition from an over-supply of regrinders was the opinion of several of the speakers. The opinion also was expressed that the secret of making money in the face of competition is to do good work and keep the customer satisfied in the question of adjustments. One instance was cited of a case where two regrinders in a town of 3000 are located across the street from each other and both making money, simply because they have been able to "sell" a sufficient number of car owners on their service.

Members of the association were uniformly of the opinion that regrinders now doing regrinding exclusively will in the future go in more for the rebuilding of engines, selling of replacement parts and kindred lines.

Production Report Approved

The report of John Percival of St. Louis on the subject of production methods was given high approval by the delegates of the association. Standard clearances, approved methods of piston fitting, dressing of grinding wheels and the mounting of commercial diamonds were a few of the 26 subjects covered in Mr. Percival's report.

One session was devoted to talks by representatives of the various replacement parts manufacturers.

Mr. Westmoreland of the McQuay-Norris Manufacturing Co. told about his company's reconditioning plan and how in effect it had been a great boon to the regrinder, although received with hostility at first. He said that it actually has resulted in an increased volume of regrinding, and that it was instrumental in convincing the public of the necessity of engine reconditioning.

It was stated that 95 per cent of the car owners are prospects for regrinding, and that the engine reconditioning plan has nothing in it to hurt the regrinder. Mr. Westmoreland urged the use of the flat rate price for regrinding and general rebuilding, and expressed the belief that most of the future business would be transacted on the flat rate plan.

It was brought out during Mr. Westmoreland's talk that regrinders for the last few years have sold their merchandise on the flat rate basis, and it was emphasized that the system should be carried on to cover complete rebuilding and also on those separate operations involved in reconditioning and overhauling.

Cooperation Urged

Mr. Lyons of the Muskegon Motor Specialties Co. urged cooperation to promote the engine rebuilding and reconditioning plan. He expressed the belief that the replacement parts and regrinding business would be exceptionally good for the balance of the year. The tendency on the part of many purchasers of replacement parts to buy solely on price was attributed by Mr. Lyons to the fact that there are too many manufacturers in the replacement field.

He stated that replacement manufacturers, like regrinders, would go through an ordeal of the survival of the fittest, and that quality and service would be factors in determining the survivors.

(*Continued on page* 1310)

Personnel of Kettering Committee Is Appointed

WASHINGTON, June 11—Secretary of Commerce Hoover is making progress in the movement which he has started to study the general subject of highway traffic safety. The personnel of one of the seven committees for which chairmen have been appointed has been completed.

This committee, of which C. F. Kettering, president of the General Motors Research Corp., is chairman, will determine ways in which mechanical equipment of motor vehicles can be made to lessen highway accidents.

Serving on this committee are C. R. Alling of the casualty department of the Underwriters Laboratory, Chicago; H. M. Crane, president of the Society of Automotive Engineers; D. C. Fenner of the Motor Vehicle Conference Committee; C. E. Pettibone of the American Mutual Liability Insurance Co., Boston; A. T. Goldbeck, chief of the Division of Tests of the Automotive Section of the United States Bureau of Standards, and Dr. C. H. Sharp, technical director of the Electric Testing Laboratories, New York City.

Railway Paralleling Own Line with Buses

Indiana Company Departs from Usual Policy So That It May Meet Competition

INDIANAPOLIS, June 12—"If the people want to ride on rubber, we will provide that facility," said Harry Reid, president of the Interstate Public Service Co., which runs a traction line between Indianapolis and Louisville, in announcing the purchase of eleven motor buses to operate between Indianapolis and Franklin as an adjunct to the main line of the traction company. Later it is possible that the company will operate buses down as far as Columbus.

Mr. Reid was quoted to the effect that the purchase is the first active step of the company to meet bus competition which has cut into the traction transportation business between here and Franklin. He declared that the company is in the transportation business and intends to give the type of service the people want.

Some time ago the company entered into traffic arrangements with truck line companies radiating from Seymour which is said to have facilitated frieght shipments from the territory, giving producers a quick market for perishable foodstuffs in Indianapolis. Many other improvements have been made by the company this year. It put five modern traction dining cars on the run between this city and Louisville, and also added three new steel sleepers. It is considered the most progressive line here.

As this is the first traction line of the State to enter the bus business actively with lines paralleling its tracks, the effect will be profoundly felt in bus business in general. Heretofore the main contention of the traction lines of the State has been that it was unfair to run buses parallel to traction lines on free highways paid for by the people and "compete unfairly with tractions." A large part of the main State highways radiating from here are paralleled by traction lines.

J. H. Williams Will Open District Sales Offices

BUFFALO, June 12—Having transferred the manufacturing operations of the Brooklyn and Chicago factories to its Buffalo works, where all its American manufacturing now is concentrated, J. H. Williams & Co., making drop forgings and drop forged tools, will open district sales offices and warehouses on July 1 at 75 Spring Street, New York, and 117 North Jefferson Street, Chicago.

In New York E. J. Wilcox will be sales manager of stock and P. Rigby of special products for the eastern territory. N. P. Linde will be in charge of stock in Chicago and A. C. Nuth of special products for the western territory.

Registrations Show Decline in Chicago

May Dropped Behind April—Buyers May Be Waiting Until July to Register Cars

CHICAGO, June 11—As barometric evidence of sales activity in the automobile business, chattel mortgage records for May of the Central Auto Finance Association and registration books in the office of the county license collector tell two different stories.

Chattels on mortgage vehicles recorded by the association for the five weeks ending May 31 numbered 4624 as compared with 3385 for the five-week period ending May 3. This would indicate that automobile sales in May were approximately 25 per cent better than in April, which was not the case, local dealers on the whole doing much less business in May than in April. What the association's figures do signify is simply that the organization recorded an unusually large proportion of the total sales volume in May.

Truer reflection of actual conditions no doubt was shown in the registration totals, the May total for passenger cars and trucks running 17,321 as against 25,948 for April, the discrepancy being 8626 in April's favor. It is pointed out at the City Hall that, while registrations frequently show which way the trade winds are blowing in motor row, this evidence often is deceptive.

Rush Is Usual in July

Just now, for instance, many recent car buyers are waiting until July 1 before paying for their 1924 license plates in order to avail themselves of the half year rate and not be obliged to pay for the full year. There is a traditional rush at the license counters in July, and that rush will come this year as usual. Passenger car truck registrations for May, compared with April, in Chicago, are shown by the following table:

	Passenger Cars	
	35 Hp. or less	Over 35 Hp.
April	23,703	418
May	15,921	241
	Trucks	
	1-Ton or less	Over 1 Ton
April	1,324	503
May	838	321

Sales of Tractors Dull in Southeast in April

ATLANTA, June 10—Reports of the seven larger distributors of tractors and farm implements in the Southeast, as contained in the April business review of the Federal Reserve Bank of Atlanta show that sales in the district in that month declined more than 30 per cent from April, 1923, and were more than 6 per cent less than during March of this year, despite the fact that March was not a particularly good month.

The outlook, however, the distributors report, is improving steadily, and with cotton prices at the present high level they are looking for much greater activity during the coming summer. Business began to improve late in April and picked up considerably during May. The decline was in line with that of the automobile industry of the district, which also experienced a decidedly dull month during April.

Survey to Be Undertaken of Roads in Chicago Area

CHICAGO, June 11—The movement to give the Chicago district more commodious highways and at the same time eliminate much of the congestion now existing took a turn in a definite direction this week when Thomas H. McDonald, chief of the United States Bureau of Public Roads, and George A. Quinland, Cook County superintendent of highways, signed a joint Government and county agreement providing for a complete research survey of the Cook County highway system.

The study will include investigation of highway transportation on all county roads during July, August, September and October, as well as scientific research into all phases of road construction and administration. The general objective of the survey is set forth in the agreement in the following words:

"To secure and develop facts and principles which will aid in the planning and construction of the most economical and serviceable highways, the best designs of roads to meet highway requirements and to further advance the science of highway development."

Work of establishing weighing, counting and estimating stations on county roads already has been started.

Hungary Permits Italy to Bring in More Cars

WASHINGTON, June 11—Consul General George Horton of Budapest advises the Automotive Division of the Department of Commerce that a commercial agreement recently entered into between Hungary and Italy gives Italy an extra quota of 10 complete automobiles a month under the import license system. The regular contingents are 50 complete automobiles a quarter. Efforts are being made, Mr. Horton says, to secure similar concessions for other countries.

During 1923 a number of agencies for automobiles were established, and much business could be done were it not for the restrictions imposed by the Hungarian government. The United States, during 1923, exported to Hungary 14 passenger cars and no trucks.

FORD'S CHARLOTTE PLANT

CHARLOTTE, N. C., June 12—The new Ford assembly plant here will be ready for operation Aug. 1. The building is practically complete, and shipments of equipment are being received. The plant will have a capacity of between 300 and 400 cars a day.

May Above Year Ago in Detroit District

But New Car Deliveries at Retail Declined from April—Truck Business Fell Off

DETROIT, June 11—Retail deliveries of new cars in the Detroit district in May totaled 8607, a decrease from the 9068 total in April, but an increase from the 7757 total in May of last year. Open car deliveries of 3867 varied only three from the April total, but closed car deliveries of 4740 fell off from an April total of 5205. Open car business in May this year was 465 under May, 1923, but closed cars showed an increase of 1315.

Ford deliveries for the month totaled 4602, about 53 per cent of the total. Deliveries of all low priced lines were 5755, or 67 per cent of the total. All cars in the $1,000 price class and under aggregated 6877 deliveries, or about 80 per cent of the total. Deliveries in the medium priced lines were 1398, or 17 per cent of the month's business, and deliveries of 252 high priced cars approximated 3 per cent.

Deliveries according to price classes for the same month last year show a wide divergence from this year. Ford percentage last May was 53 per cent; all low priced lines, 56 per cent; all cars $1,000 and under, 70 per cent; medium priced lines, 26 per cent, and high priced lines, 3 per cent. In April, this year, Ford deliveries were 55 per cent of the total; all low priced lines, 68 per cent; $1,000 price class and under, 80 per cent; medium priced lines, 16 per cent, and high priced lines, 4 per cent.

Deliveries of Other Makes

Leading companies in deliveries next to Ford were Chevrolet with 799, Dodge 452, Buick 375, Hudson-Essex 315, Studebaker 302, Maxwell-Chrysler 294, Overland-Willys Knight 247, Oldsmobile 135, Star 114, Paige-Jewett 112 and Nash 102. Cadillac led the high priced deliveries with 92; Packard had 57, Wills Sainte Claire 33, Lincoln 24, Marmon 16.

Truck deliveries for May were 682, a decrease of 10 from the same month last year and a decrease from a total of 741 in April, this year. Ford truck deliveries were 382, which compares with 458 in April and 432 last year. In the heavy duty field Mack delivered 27, White 24, G. M. C. 21, Federal 20, Gotfredson 19, International 11 and Diamond 10. Yellow Cab delivered 36 buses, which are included in the truck total. Fourteen tractors were delivered.

FORD PLANT AT DALLAS

DALLAS, TEX., June 11—Contract for the erection of a new Ford assembling plant at Dallas has been awarded. The first unit of the plant will be completed before the first of next year. The amount involved in the initial contract was $1,000,000.

BANK CREDITS

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

Production and trade continue at a reduced rate, most lines of business proceeding at levels materially lower than those of a year ago. The decline in commodity prices continues, while stock quotations have moved irregularly, railroads and public utilities in general showing more strength than the industrial issues.

Car loadings in the week ended May 24 numbered 918,213, comparing with 913,407 in the preceding week and 1,015,532 in the corresponding period last year. Railway earnings in April represented a net annual return of 4.72 per cent on the tentative valuation, as against 6.50 per cent in April, 1923.

The production of pig iron in May totaled 2,615,110 tons, as compared with 3,233,428 in April and 3,867,694 in May of last year. The average daily output of 84,358 tons compares with 101,781 in the preceding month and 124,764 a year ago. The total output of steel ingots last month amounted to 2,628,261 tons, as against 3,333,535 in April and 4,216,355 in May, 1923.

Business Failures Move Up

Business failures reported to Bradstreet's for May numbered 1744 as against 1730 in April and 1470 in May, 1923. In comparison with last year, the greatest relative increases are in the South and West.

Bank debits to individual accounts, as reported to the Federal Reserve Board for the week ended June 4 (a holiday week), amounted to $9,058,000,000, less than 1 per cent below the total for the preceding week. As compared with the total for the corresponding period last year, which was a full week, the current figures show a decline of about 11 per cent.

Fisher's index number of wholesale commodity prices stood at 143.3 last week, comparing with 144.5 for the preceding week, and marking a decline of 11.9 points, or 7.7 per cent, from the year's peak on Feb. 9. Bradstreet's monthly wholesale price index declined in May for the sixth consecutive time, standing at $12.2930 on June 1, as against $12.5568 on May 1 and $13.3841 on June 1, 1923.

Bank Discounts Declined

Discounts by Federal Reserve banks declined $28,200,000 during the week ended June 4, the decline being entirely accounted for by bills secured by Government obligations. Bills bought in the open market declined $31,100,000, while holdings of Government securities increased $64,600,000. The circulation of Federal Reserve notes decreased $7,100,000, while total deposits increased $43,700,000 and reserves $10,600,000. The reserve ratio declined from 82.7 to 82.2 per cent.

Loans of reporting member banks declined $29,000,000 during the week ended May 28, while investments increased $38,000,000. Net demand deposits showed no change for the week, while borrowings from the Reserve banks increased $7,000,000.

Interest rates declined further last week, call money ranging from 2½ to 3 per cent, as against 2¾ to 4½ in the preceding week. Time loans were quoted at 3½ to 3¾ per cent for the shorter maturities, comparing with 3¾ to 4 per cent the week before.

FINANCIAL NOTES

Borg & Beck reports net earnings for the the first four months of $145,751 after all charges excepting Federal taxes. This is equal to approximately $1.26 a share on 100,000 shares of common, after allowing for taxes. The company has declared its regular quarterly dividend of 50 cents, payable July 1 to stockholders of record June 20.

Dunlop Rubber Co., Ltd., of England reports profits from all sources in 18 months to December last of £1,915,608 after interest on debentures, etc., £463,815. Net profit of £1,451,792 was shown, this profit not taking into account the deficit of the American company in 1923.

Fisk Rubber Co. reports net sales for the six month priod ended April 30, of $23,200,000, with operating profits, after depreciation but before interest and Federal taxes of $1,453,923. After interest and taxes the company carried $754,760 to general surplus.

Reo Motor Car Co. has declared an extra dividend of 1 per cent and regular quarterly 1½ per cent, payable July 1 to stock of record June 16, the same distribution as was voted in the two preceding quarters.

Mack Trucks, Inc., has declared the regular quarterly dividends of $1.50 on the common and $1.75 on the first and second preferred, all payable June 30 to stock of record June 16.

Goodyear Tire & Rubber Co. has declared the regular quarterly dividend of 2 per cent on the prior preference stock, payable July 1 to holders of record June 20.

Chandler Motor Car Co. has declared its regular quarterly dividend of $1.50, payable July 1 to stockholders of record June 20.

American Chain Co. has declared the regular quarterly dividend of 50 cents a share on Class A stock, payable July 1.

Electric Storage Battery Co. has declared a $1 quarterly dividend, payable July 1 to stockholders of record June 20.

New York to Albany Bus Line Is Being Planned

NEW YORK, June 10—The Hudson River Tourist Bus Co. is planning to operate a through line of buses between New York City and Albany, capital of the State, approximately 150 miles, putting on two 24-passenger coaches, which will run each way every day.

The north-bound vehicles will not accept passengers between New York and Wappingers Falls, which is about half way, while south-bound buses will not take on passengers south of the same town. The company now is securing permission from the various towns en route to operate on the streets passing through each city and village.

Canadian Industry Increases Capital

Although There Were Fewer Companies in 1923, Investments Show Big Gain

WASHINGTON, June 11—Despite the fact that there were five fewer companies engaged in automobile manufacture in Canada in 1923 than in 1922, the capital employed increased from $47,761,964 in 1922 to $60,146,195 in 1923, a report on the industry in Canada for the year 1923 discloses.

The report has been transmitted to the Automotive Division of the Department of Commerce by Vice-consul Gilson G. Blake at Ottawa, Ont. It explains that the firms that went out of business were among the smaller ones.

The report says:

Production Broke Record

The production of motor vehicles in Canada during 1923 exceeded all records and reached a total of 147,582, valued at $97,369,814, as compared with 101,007 in 1922 and 94,144 made during 1920. The value of the production by the industry proper in 1923 was $96,614,176, and while this was 18 per cent greater than in 1922, it did not come up to the total of the 1920 production, which amounted to $101,465,846.

Service and service parts included in the 1923 total were valued at $9,390,793, while the same item in 1920 amounted to $12,754,125, leaving the value of motor cars in the automobile industry in 1923 at $87,223,383, and in 1920 at $88,711,721.

The production during 1923 consisted of 106,226 passenger cars, valued at $49,904,073; commercial cars to the number of 19,226, valued at $8,941,011; and 21,750 chassis, valued at $8,378,299. The passenger car total was made up of 5296 roadsters, 71,861 five-passenger phaetons, 1860 seven-passenger phaetons, 10,051 coupes, 16,677 five-passenger closed cars and 481 seven-passenger closed cars.

The estimated yearly capacity of the plants is 186,500 automobiles and 10,100 trucks, so that the production in 1923 of 147,202 vehicles, was 75 per cent of capacity.

The average selling value at the factories of the roadsters was $532; the five-passenger phaetons, $586; the seven-passenger phaetons, $1,337; the coupes, $604; the five-passenger closed cars, $910; the seven-passenger closed cars, $2,565, the chassis, $385; trucks under 1-ton, $424; trucks 1-ton to 5-ton, $466 and trucks 5-tons and over, $6,450.

Consumption of Vehicles

The consumption of motor vehicles, arrived at by adding the quantity produced to the number imported and deducting the exports, was 58,790 passenger cars, 8506 trucks and 21,750 chassis. There were 586,764 motor vehicles registered in Canada during 1923. The ratio registrations to population was one vehicle to 15.6 persons for the whole Dominion.

The value of motor vehicles and parts imported into Canada during 1923 was $32,081,604. The value of the exports of automobiles and parts during 1923 was $37,359,069 and these figures show an increase of 55 per cent over those for 1922.

Britain Not Looking for Big Price Drop

Some Makers Announce There Will Be No Change—Others Have Made Reductions

(*Continued from page* 1296)

that Austin has dropped 6d. per share since April; Crossley, 3d.; Harper Bean, 6d.; Humber, 1s. 3d.; Rolls Royce, 6d.; Rover, 1s. 6d.; Sunbeam-Talbot-Darracq, 9d., and Vauxhall, 1s. 3d. Napier prices have been maintained.

Since the Budget was announced the output of Morris cars has decreased 50 per cent. This factory has dismissed 1302 men, while the remaining 4250 are now working short hours. The Midland motor factories have discharged 2035 men.

Among all the jeremiads from the British industry comes the statement that the British export trade for automobiles is increasing. Official attention is now being paid to this matter, for the Board of Trade has agreed to set up a committee of inquiry into the whole question of export trade.

Discuss Gasoline Tax

At a recent Parliamentary dinner the question of the alteration of the present system of taxation to a tax on gasoline was discussed. It was urged that private car owners and motorcyclists were justly entitled to a 25 per cent reduction of the existing taxes. This question is generally regarded as a non-party matter, and it is probable, when the Departmental Committee's report is issued later this month, that amendments will be couched in such a way as not to jeopardize the position of the Government if the House decides on making substantial alterations to the proposals.

Many road ventures of importance are under consideration, for it is felt that the real solution to traffic congestion is not only wider streets, but two level highways. A new highway is to be built to connect Glasgow and Edinburgh; a 25 mile length of motor road is to connect up the Isle of Thanet with the main London-Dover road; while the Devonshire County Council is seeking Government authority to spend £1,000,000 on road reconstruction.

Talk of Elevated Crossings

At a recent meeting of the Roads Improvement Association, it was suggested that no building abutting on first-class roads within 25 miles of Charing Cross should be built within 75 ft. of the center of the highway. Movements are afoot, too, for the building of elevated street crossings at the more important nodal points in London, such as Hyde Park Corner.

Harry Gosling, Labor Minister of Transport, is a declared Good Roads devotee. He has charge of a fund whereby £14,000,000 can be spent annually on road improvements. If the Government remains in power for any length of time Harry Gosling's policy of nationalizing the main roads of Britain cannot but have an important effect in increasing motor sales.

INDUSTRIAL NOTES

Husky Wrench Co. of Milwaukee has been organized by a number of men formerly with the Snap-On Wrench Co. of that city to engage in the similar line of manufacturing mechanics' tools, especially for garage and repairshop use and for original car kit equipment. Joseph O. Wirtish, formerly manager of the Snap-On company, and Siegmund Mandl and Oscar W. Engerson are the principals in the enterprise.

Demountable Battery Corp., formed recently with $100,000 capital at Alexandria, La., according to announcement by W. Knoblock, president, Brooklyn, N. Y., has acquired a building in Alexandria and will start at once the establishment of a large plant there for the manufacture of batteries.

A. C. Miller & Co. of Atlanta, Ga., has acquired a site in that city and taken a building permit for the construction of a plant for the manufacture of motor truck bodies. Including equipment, the plant will cost about $100,000.

Ramsey Chain Co., Albany, N. Y., announces the appointment of the Morse Engineering Co., 549 West Washington Street, Chicago, as its representative in that city. P. A. Morse is the active head of the new connection.

Exports Show Increase in Ignition Apparatus

WASHINGTON, June 12—Exports of spark plugs, magnetos and other ignition apparatus from the United States during March totaled 101,948 pounds, valued at $146,404, the Bureau of Foreign and Domestic Commerce announces. Canada and France took by far the greatest amount, the former receiving 24,943 pounds of a value of $38,957, while the latter accounted for 21,557 pounds, valued at $32,454.

Belgium and Kwangtung rank third and fourth in the receipt of the ignition apparatus, while the other countries took small and scattering amounts. Belgium is credited with 9543 pounds, worth $13,005, and Kwangtung accounted for 8575 pounds, valued at $12,617.

Excellent Car Demand Continuing in Brazil

WASHINGTON, June 11—The demand for automobiles in Brazil continues excellent, Trade Commissioner W. E. Embry has advised the Department of Commerce. Mr. Embry adds, however, that importers are having great difficulty in clearing cars through Santos, which is the port of most automobile imports.

Approximately 200 cars were received at Santos in the first 20 days of May, and all but 20 were American. An American plant assembled 903 cars and trucks at Santos in the same period.

Government to Allot Federal Road Funds

Provision for Distribution of $75,000,000 Made in New Appropriation Bill

WASHINGTON, June 12—Provision for Federal aid for the fiscal year 1925, which begins on July 1, is made in the Agricultural Appropriation Bill, signed by the President on June 5.

The bill authorizes the Secretary of Agriculture to apportion to the States immediately the $75,000,000 authorized by the Post Office Appropriation Act of June 19, 1922, and appropriates $13,000,000, to be available immediately, the remainder to be made available in later appropriations.

The Secretary signed the apportionment order June 6, and as a result there will be no interruption to Federal-aid road work.

The apportionment is made to the States on the same basis as in previous years, except that Hawaii for the first time is admitted to a share on the same basis as the States. This has been provided for in an act of the recent session of Congress.

32,099 Miles Completed

Since 1916 a total of $540,000,000 has been made available by Acts of Congress, and the Bureau of Public Roads of the Department of Agriculture, which administers these funds, reports the status on May 31 as follows: Completed, 32,099 miles; under construction, 17,000 miles; approved for construction, 2518 miles, and $33,106,126 available for new projects.

Practically all of the old funds and the entire amount of the new funds have been or will be expended on the Federal-aid highway system of the United States. This system, provided for by the Federal Highway Act of 1921, consists of approximately 170,000 miles of road and has been designated by the States and approved by the Federal Government.

At the beginning of the present year it was estimated that 60,000 miles of the system had been surfaced and about 8700 miles graded, leaving 110,000 to be surfaced. Some of this work had been done by the States independent of Federal aid.

National Forest Roads

The new legislation carries an appropriation of $6,000,000 for national forest roads and trails, $3,500,000 of this amount being the remainder of the $6,500,000 authorized for the current fiscal year and $2,500,000 being the initial appropriation of the $6,500,000 previously authorized for the fiscal year 1925.

The Secretary of Agriculture is also authorized to apportion and enter into contracts against the $4,000,000 remainder of the authorization for 1925 not yet appropriated.

Calendar

SHOWS

Jan. 3-10—New York, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Bronx Armory.

Jan. 24-31 — Chicago, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Coliseum and First Regiment Armory.

FOREIGN SHOWS

July 1-15 — Dunkirk, France, Northern European Fair. Headquarters, No. 2 Rue Gaspard Malo, Dunkirk.

Aug. 23 - Sept. 2 — Bratislava, Slovakia, International Danube Fair.

Aug. 23-Sept. 6—Toronto, Ont., National Automobile Show in conjunction with the Canadian National Exhibition under the sanction of the Canadian Automotive Equipment Association and the Automotive Industries of Canada.

September — Vienna, Austria, Vienna International Fair.

Sept. 21-28 — Prague, Czecho-Slovakia, Prague Autumn Fair.

Oct. 2-12—Paris, passenger cars, motor cycles, bicycles and accessories, Grand Palais.

Oct. 17-25—London, Annual Passenger Car Show, Olympia.

Oct. 22-31—Paris, motor trucks, stationary engines, garage tools and machine tools, Grand Palais.

RACES

July 4—Kansas City.

Aug. 3—Lyons, France, European Grand Prix.

Sept. 1—Altoona.

Sept. 1—Syracuse.

Sept. 7 — Monza Track, near Milan, Italy, Italian Grand Prix.

Oct. 4—Fresno.

Oct. 19—Kansas City.

Nov. 24—Los Angeles.

CONVENTIONS

June 24-27—Atlantic City, American Society for Testing Materials.

Sept. 8-11—Eaglesmere, Pa. Annual Meeting of the Automotive Electric Association.

Sept. 22-26—Boston, Sixth Convention and International Steel Exposition of the American Society for Steel Treating.

Jan. 5—New York, Convention under the auspices of the National Automobile Dealers Association, Hotel Commodore.

Jan. 26-29—Chicago, Eighth Annual Convention of the National Automobile Dealers Association, Hotel LaSalle.

S. A. E. MEETINGS

June 24-27—Summer Meeting of the S. A. E., Spring Lake, N. J.

September—New York City, S.A.E. Automotive Transportation Meeting.

Oct. 21-24—S. A. E Production Meeting, Detroit.

Nov. 18-19—Joint Service Meeting of the S. A. E. with the N. A. C. C. Cleveland.

—Aeronautical Meeting at Dayton at the time of the Pulitzer Races.

January—S. A. E. Annual Meeting, Detroit.

Automotive Exports Assume Third Place

WASHINGTON, June 12—Exports of automobiles and parts in 1923 ranked third among all commodities shipped from the United States, according to Percy Owen, chief of the Automotive Division, Department of Commerce. The value of exported automobiles and parts was $166,000,000, a 70 per cent increase over 1922.

Standing far in advance of all other manufactured articles in the export tables, automotive products are exceeded in value of foreign shipments only by unmanufactured cotton and refined mineral oils, valued respectively at $807,000,000 and $326,000,000.

In 1922 automotive exports held sixth place among the commodities exported, with a value of $98,000,000. Their rapid increase during 1923 improved their position so markedly that they are now exceeded only by the two principal exports of the country, cotton and mineral oils.

A new compilation of figures, completed by the Census Bureau, upon which Mr. Owen's statement is based, includes only automotive shipments from the territorial United States. Had the figures taken into account the exports from American factories in Canada and the production of American assembly plants in four countries, Mr. Owen declares, the value would have been nearly doubled.

Sacramento Reports May Sales Good as Last Year

SACRAMENTO, CAL., June 11—Dealers in Sacramento and the valley and mountain counties tributary to this city continue to report sales as good. Practically all dealers say business for May was equal to last year, and a few report it was better.

Complete figures on April sales showed that Sacramento County did 5 per cent more business than April of last year, despite the fact that the State as a whole showed a 23 per cent loss. About the same applied to Sacramento Valley and northern mountain counties.

Local dealers report that the used car business is much better with the coming of warm weather, and most dealers are reducing their stocks of used cars with little effort.

Gasoline Output Sets New Monthly Record

WASHINGTON, June 11—The petroleum refineries of the United States established in April another new monthly record for the production of gasoline, when the output amounted to 754,773,232 gal., states the Department of the Interior through the Bureau of Mines. This figure surpasses by more than 11,000,000 gal. the high record production mark made in March, which in turn had passed by 48,000,000 gal. the previous high record set in January.

The largest stocks of gasoline in the country's history were on hand at refineries May 1, according to the Bureau of Mines' figures, which show total supplies amounting to 1,607,786,406 gal. The figures represent an increase of 36,381,737 gal. over the figures for April 1, at which time a new high mark had been recorded. The daily increase in gasoline production in April, 1924, over the corresponding month in 1923 was 4,524,352 gal., or 21.9 per cent. Compared with the output for March, 1923, there was a daily increase of 1,183,357 gal., or 4.9 per cent.

That the millions of automobile owners are consuming gasoline at an unprecedented rate is shown by record-breaking consumption figures. The domestic demand for gasoline in April was 609,077,546 gal., a daily average of 20,302,585 gal., as compared with the daily demand in April, 1923, of 16,190,559 gal., an increase of 4,112,026 gal. daily, or 25.4 per cent. The daily increase in domestic demand for gasoline over March, 1924, was 4,941,318 gal., or 32.2 per cent. Exports increased 31,851,191 gal. over the preceding month, and imports fell off 5,596,537 gal. during the month.

Regrinders to Start Publicity Campaign

(*Continued from page* 1306)

Mr. Warfield of the Gill Manufacturing Co. stressed the importance of doing business at a profit and spoke of the growing replacement parts business and of the opportunity for regrinders to handle the merchandise of the replacement manufacturer. An arrangement has been made allowing members of the association to buy replacement parts direct from the manufacturer at attractive discounts, he said.

The opinion was expressed by Mr. Warfield and other replacement parts representatives that the established regrinder provided a logical outlet for their merchandise, and that they intended to give the regrinders their fullest cooperation.

Ask Tax Cut on Pistons

While the replacement parts manufacturers were assembled, the chairman of the association read several communications from manufacturers who are members of the National Piston Manufacturers Association. The text of all these letters was a plea to the individual regrinders to assist the piston manufacturer in the effort to have pistons exempted from the Federal excise tax.

As a result of these letters and the concerted action of the association delegates, it is believed that sufficient material and evidence are on hand to prove that pistons are a commercial commodity and not strictly automobile parts. Individual regrinders were urged to make as complete a list as possible of those passenger car pistons that are duplicates of or that may be used in commercial vehicles, power lawn mowers, air compressors and other engines.

When these replacement lists are completed, it is the intention to send a committee to Washington to make an effort to obtain a refund of excise taxes already paid and exemption from further taxation on pistons.